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CARING FOR THE SECOND SENSE

P A COMMUNICATIONS ANNOUNCER SYSTEM

Model; DATIS Type DA6U6 (Type Six Datis)

USER MANUAL

This document describes the product fully. Technical information has been included to provide interested readers with background to "How it works", engineering staff should find key information in each section that enables product support.

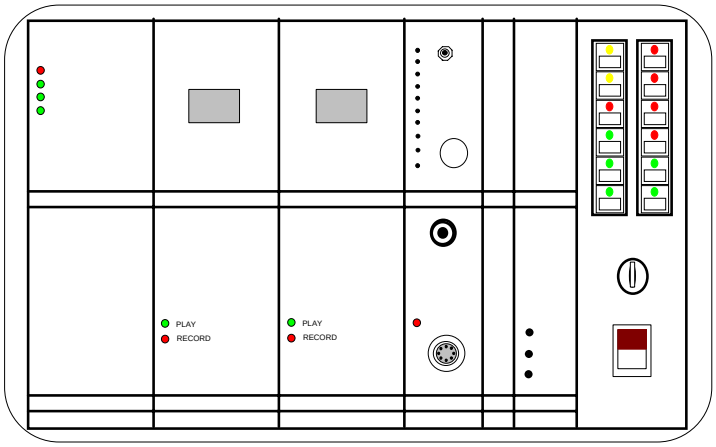
CONTENTS section.

INDEX

Filename = DA6MAN8
Manual dated MAY 2004, Issue eight (b) [(b)=layout formatting changes].

INTRODUCTION AND DESCRIPTION

DATIS is a form of ATIS, the Air Traffic Information System that uses digital recording and message playback techniques eliminating the wear and tear problems of mechanical systems and thus increasing the reliability and availability of the service.



The DA6U6 is a desk top version of DATIS which is operated at the front panel controls.

It has a LEMO connector on the front of the DM2 for the user's headset.

Both Voice stores have Alphanumeric Status Displays.

The P. A. Communications "DATIS" provides a continuous flow of spoken information by replaying a recorded message.

The message text is recorded by the operator and is retained in a VOICE STORE, when the message is recorded and checked it may be put into service as being the current information.
The entire process of storage and replay of the text involves NO MOVING PARTS.

NATO Stock No. 51 RA 0160548

The equipment consists of 6U height plug in units housed in a desk top case.

There are TWO IDENTICAL voice stores contained within the equipment.
One of the two stores is selected for providing the message for transmission and is termed the "ONLINE STORE", the other store is available for preparation of further messages, (without disturbing the online transmission) and is referred to as the "STANDBY STORE".

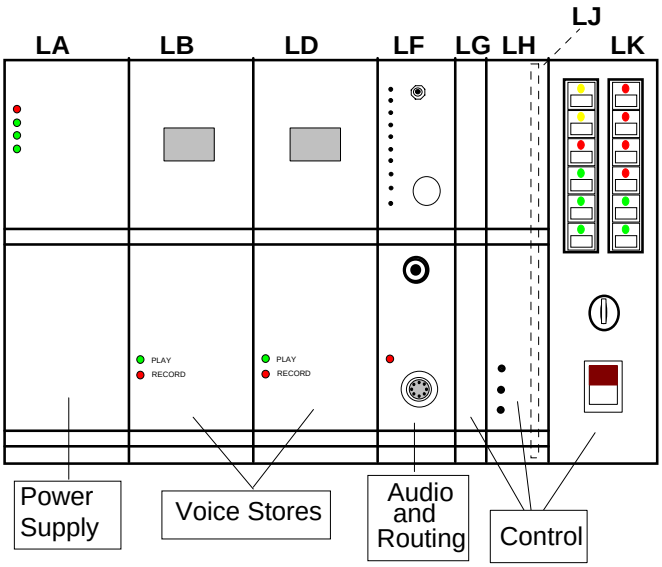
The press button switch panel is used both for preparing stored messages and to make the selection of which store should be Online.

The audio output is sampled by the equipment to ensure that it remains within specification, should the output level fall or be inaudible the ALARM will break a normally closed dry contact.

The operator may select between "line", "standby" and "off-air" (when an external receiver is provided for the off-air facility) by pressing one from three buttons provided on the control panel.

Both the Audio Output and the "off-air" input have telecommunications line interfaces, approved for connection to B.T., in order that distant transmitter or receiver sites may be used.

SYSTEM OVERVIEW 1.2



The DA6U6 is housed in a desk top cabinet, constructed using modular Eurocard sized plug in units.

Plug in unit LJ does not have it's own front panel,
It is fitted behind LH and requires the removal of both LH and LK before withdrawal.

From left to right they are :-

Unit	Part no.	Description
LA	S33018	Power supply which supplies plus five, plus twelve and negative five volts.
LB	P21028	The first of two identical voice stores.
LD	P21028	The second of two identical voice stores.
LF	P27270	Audio routing module. Contains audio input and output stages. The audio output from the voice store that is online is selected and amplified by DM2.
LG	P11264	Control of system. Pressing a switch at the control panel causes the DLC2 to issue a command onto the Announcer Buss Control, (ABC).
LH	P11263	Indicator Driver board.
LJ	P21327	Ring Trip Telephone line interface board.
LK	P11267	Switch panel (controls) and Lock Switch.

To remove the Ring Trip Interface board, LJ, from the sub rack it is first necessary to unscrew and extract the plug in units either side, namely LH and LK. (else the transformer on the ring trip card will catch on the front of the switch panel.)

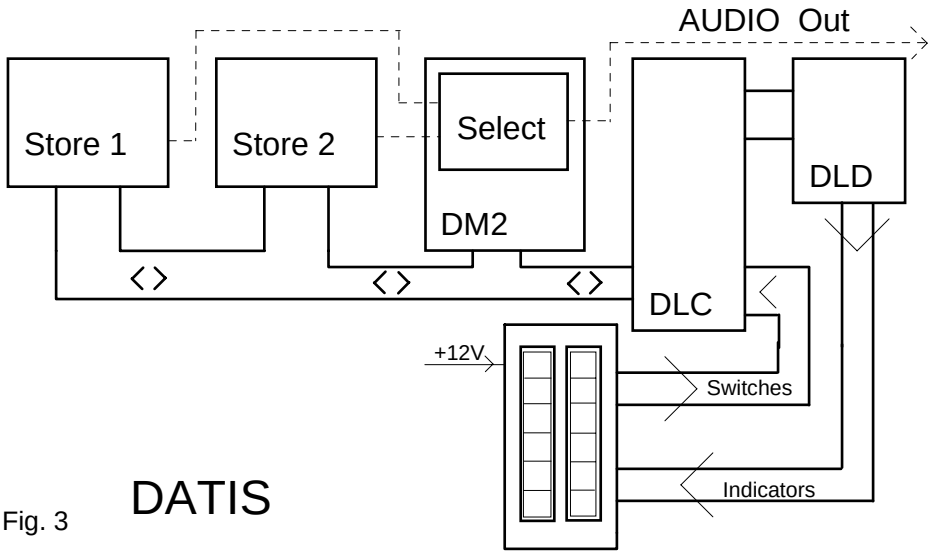


Fig. 3 DATIS

The DATIS has two message stores allowing one store to be operational and the second to be prepared for the next message. Changeover, when initiated, will occur at the completion of the message currently being transmitted.
Messages upto two minutes are recorded via the microphone of the operators headset and played back on continuous repeat until the operating requirements are changed.
The audio voice signals from the DATIS to the ATIS transmitter are continuously monitored and an alarm is given if the signal fails or drops to a low level.

Features of the Type DA6U6 DATIS. 1.4

Equipment practice	Standard Eurocards. Mounted in a desk top cabinet housing 6U height plug in units.
Equipment operation	By means of front panel controls. Momentary press button switches.
Length of announcements	Either channel, each has a maximum text capacity of 128 seconds.
Coding of signals	Standard A-law companding code following CCITT Vol.III-2 Rec.G.711,712,733. 64K bit/sec.
Frequency range	300-3400Hz +-3db
Signal to noise ratio	neg 45 to neg 50db
Distortion	less than 3%
Temperature range	Operation 0°C -- +50°C Storage -20°C -- +80°C
Audio Output	Balanced output, isolated by line transformer. Impedance 600 0hm. Level adjustable from -20 to 0db
Power requirements	230 V AC + or - 10% Mains Frequency 47-63 Hz. with aux. D.C. 24V backup input.
Power Consumption	40 Watts.

VOICE STORES 2.1

The variable text voice store cards used in the equipment are two identical 6U plug in units. Each has a control microprocessor which is used to manage the storage and recovery of digital samples.

The samples are stored in text memory at a rate of 8000 per second.

The signal to be recorded is sampled and quantised according to CCITT "A Law" which is specifically designed for processing communication quality speech. The sample so processed becomes an encoded number which is stored into memory.

It can be seen that the memory needs to be of sufficient size to accommodate the length of text that comprises the message. The rate at which memory is used is 64,000 bits per second (64Kbps), hence a message of around 64 seconds will “fill one memory chip".

The microprocessor is used to store away the samples into the memory, it is also used to recover the samples so that the waveform may be reconstructed when the message is to be replayed. Hence a similar process to a tape recorder is taking place but doing so with no moving parts, no tape, nor wear to rotating parts or to any magnetic media.

Each announcer card has it's own operating software in the form of a plug in read only memory, which is non-volatile, this is termed firmware.
i.e. it remains if power is disconnected.

The memory chips that are employed to store the message text are the volatile type known as Dynamic RAM which requires that the DA6U6 is kept powered to store the text.
When the DA6U6 is disconnected from the power source it will erase messages that have been previously recorded.

Both voice stores share in controlling the whole system, the control firmware in EPROM is a vital part of that process and is unique to a particular type of Datis.
The DA6U6 control firmware has a driver for the alphanumeric display and observes the Bar Inhibit line to ensure that complete bulletins are heard following an INHIBIT command.

Addition of the ring trip option to allow telephone access to the message requires that appropriate level of firmware is also installed in both voice stores.

The revision number of software that a voice store has fitted is displayed in the scrolling message that can be observed in both of the store's displays when the power is first switched on. At the time of writing this is “DA6DM2”
Pressing the Play button when "NO TEXT" message is scrolling will repeat the revision number details.

POWER SUPPLY 3.1

The DATIS range of equipment use standard size plug in units according to the subrack size, so the DA6U6 has a 6U power unit and DA3U4 has a 3U height power unit.
This DA6U6 is fitted with an A.C. power source that has an auxiliary D.C. input.

N.B. When using the ealier type of power supply plug in unit [S33017] the auxiliary D.C. input MUST BE EARTH FREE, ideally a battery with an isolated charger.

The DA6U6 requires an input power source of nominally 230 volts A.C. which is fed to the power supply unit, transformed down and rectified to provide the "raw D.C." of 40/55 Volts to the "secondary switcher".

The term "secondary switcher" refers to a switch mode power supply which does not operate on the mains input but rather that it uses a lower rectified voltage from the "transformer secondary" which is subsequently chopped by the switching transistor.

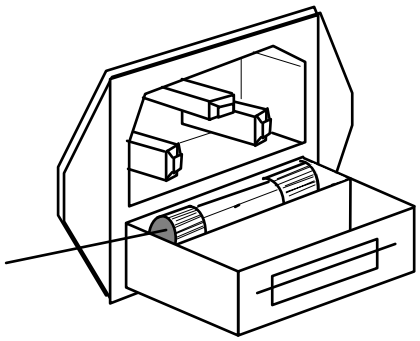
The D.C. input is stored by an electrolytic capacitor and is chopped by a VMOS power FET at a frequency of about 26KHz.

The output energy is controlled by varying the "on time" of the VMOS power FET (Pulse Width Modulation) and regulated by comparing it's output with a reference.

The plus five volt rail is the main regulated output, the plus twelve is obtained by taking a step-up tap from the output choke. The auxiliary supply of negative five volts is generated from a separate winding on the ferrite transformer upon which the output choke is wound.

Isolation (from earth) is provided by the either mains or switching transformer (or both) dependant upon the type of plug in unit used, allowing the zero volt terminal of the power supply to be internally connected to both mains earth and chassis.

<u>FUSES - locations and values.</u>



On rear of DA6U6.

Mains fuse, inside IEC receptacle

20mm type 3.15 A M

On the plug in unit LA, unscrew front panel screws and withdraw.

The DA6U6 employs one of three different plug compatible power supply units.
The earlier type, S33017, has a PSU board fixed onto the 6U plug in board, the small board has two fuses and more fuses are fitted on the 6U plug in board.

The later type, S33751, has a single printed circuit board that has the identification B33007 on the print side together with a silk screen legend on the component side
The S33751 has a higher specification than the earlier type and is fitted with higher temperature (105°C) capacitors. All fuses on this pcb are on the "main board".
The present type, S33018, is electrically similar to the S33751 but has a repositioned mains transformer with a lower centre of gravity.

POWER SUPPLY (continued) 3.2

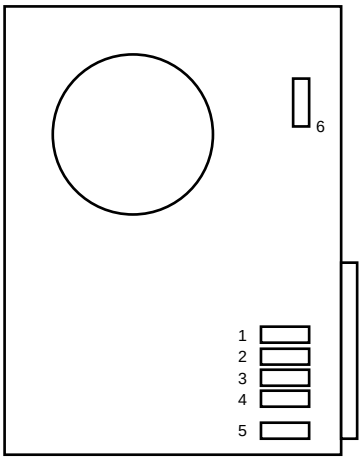
The DA6U6 employs one of three different plug compatible power supply units.

The earlier type, S33017, has a Daren DPS37A fixed onto the main PSU board.

The later types are constructed as a single printed circuit board, the S33751 has the identification B33007 on the "copper" (or solder) side of the board.

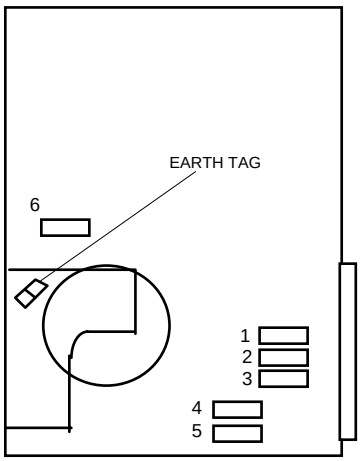
The most modern type is the S33018, has an identification of B33077 on a double sided plated through hole printed circuit board.
These both have a higher specification than the earlier type using a 60Watt isolated DC-DC converter type, having an operating frequency in the region of 26KHz.and is fitted with higher temperature (105°C) capacitors.

The S33751 & S33018 accept both A.C. and D.C. input power, offering ground isolation from either power source with automatic changeover between the dual input sources.



S33751

Fuse 6 = 3.15A HRC



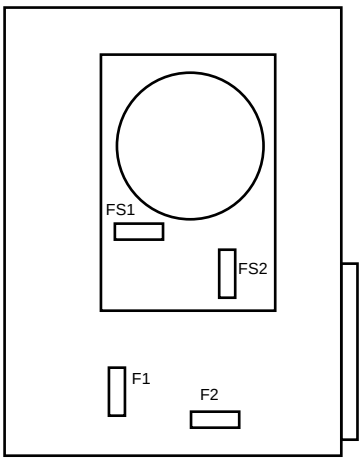
S33018

Fuse 6 = 1A HRC

FUSES - locations and values.

Fuse		20mm type
1	12V	2 A F
2	5V	5 A F
3	neg 5V	200 mA F
4	D.C. in	3.15 A F
5	D.C. in	3.15 A F
6	Raw D.C	

<u>S33017</u>, the earlier type, with a smaller board fixed onto the 6U plug in board LA.



S33017

S33017 FUSES - locations and values.

Fuse		Location	20mm type
F1	Aux D.C.	on pcb LA	3.15 A F
F2	Aux D.C.	on pcb LA	3.15 A F
FS1	Raw D.C	on PSU pcb	5 A F
FS2	Neg 5V	on PSU pcb	1 A T

INSTALLATION and COMMISSIONING 4.1

CONNECTIONS.

The DA6U6 is contained in a desk top case.
The user's headset plugs into the eight way LEMO connector on the front panel, the other connectors are at the rear.

POWER.

The Main system is designed to operate from AC Mains supply of between 200 and 264 Volts, 45-65 Hz.
The power should be connected via the plug-in IEC receptacle on the rear panel, using the plug in lead supplied.

The IEC receptacle on the rear panel accepts a 20mm fuse, accessible when the lead is unplugged, and should be fitted with a 3.15AM type.

AUXILIARY D.C. INPUT

The D.C. power should be connected via the 4 way connector on the rear panel, this is intended for the connection of a battery to maintain the system and protect the text during mains failure.

The neon lamp inside the mains switch will be not be lit if the mains supply fails, the aux D.C. will sustain the complete system - all other indicators will operate normally.

Where the Aux. D.C. option is employed and the equipment is to be switched off for any reason, it will be necessary to first unplug the connector carrying the 24V. D.C. (Skt. 2).

N.B. If the DA6U6 is fitted with an **old** power supply unit (see page 7) the auxiliary D.C. input MUST BE EARTH FREE, ideally a battery with an isolated charger.

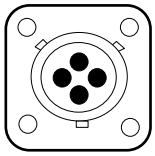
With the old power supply unit fitted, ensure that neither leg of the auxiliary D.C. input is either connected to earth, either directly or via the wiring in other equipment that may be fed by the aux. supply (should one exist).

The plus terminal of the auxiliary D.C. input is 0.7 Volt potential away from zero volts and chassis. Audio lines are transformer isolated. If in doubt contact P.A. Communications at Stewkley.

The **new** type psu, S33751 \ S33018 is a 60 Watt **isolated DC-DC** converter type, the output is derived from a ferrite transformer, allowing both auxiliary D.C. input terminals to "float" with respect to zero volts and chassis.

The pinout of the four way connector at the rear of the DA6U6 is as follows:-

pin A	plus
pin B	no connection
pin C	minus
pin D	no connection



CONNECTION OF AUDIO LINES and TRANSMITTER. 4.2

Connections are made at the rear of the equipment via two type B (Post Office type) Jack sockets.

One is for connection to the transmitter the other is an input which accepts an audio pair from a monitor receiver (via TXF 2 and the fuse disconnection barrier components).

They are marked as follows :-

TX output to transmitter.
RX input for audio from "off air" receiver.

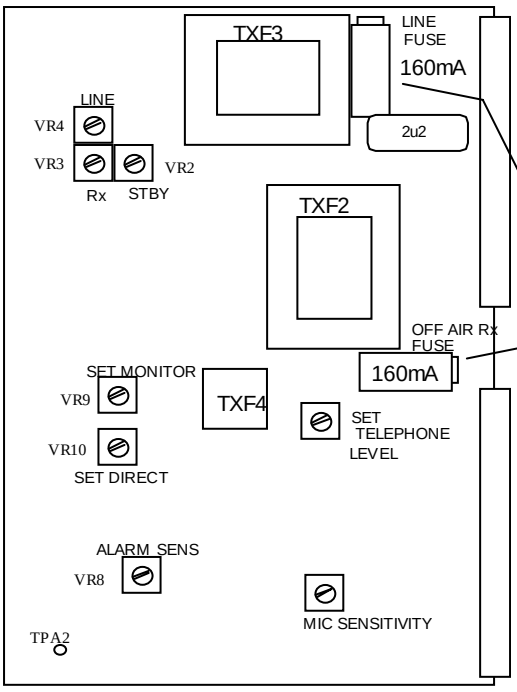
The Audio Output is designed to key the transmitter using the audio pair. When the transmitter is required to send (TX ON) either RLA or RLB contacts provides a low resistance loop.

The audio output transformer has a split secondary which has the A.C. circuit completed with a 2u2 capacitor.
The contacts of RLC are used to key the transmitter, by placing a short across the 2u2 capacitor.

The DM2 module is fitted with a screwdriver operated preset control marked "Line adj.", this is used to set the audio level sent down the line to the Transmitter.

The range of this preset is nominally 20dB, adjusting from neg 20 to plus 2 db.

The equipment leaves the factory set for neg 13db.



P27260

Both line pairs have fuse disconnection barriers which employ 20 mm type 160 mA quick blow (F) fuses, these are in enclosed fuseholders on the DM2 plug in unit P27260.

The transmitter barrier fuse is next to TXF3.

The receiver barrier fuse is between the two edge connectors near TXF2.

To change a fuse it is necessary to withdraw the DM2 from location LF.

INSTALLATION : PRELIMINARY TESTS 4.3

On the extreme left of the subrack front panel, a led marked "ON" indicates the presence of power to the system once it has been switched on with the rocker type power switch at the right of the equipment.

During initialise, when the power is first switched on, both of the voice stores leds will light for about one second indicating that they are both "healthy".

Each Voice Store has an alphanumeric display, used to indicate what each store is doing. The control software revision number and result of the memory test is seen briefly at initialise. (Approx. 10 Secs.)

During the memory test the display shows the word TEST followed by T128 which indicates that the text storage capacity is 128 seconds.

The minimum amount of operational memory is one row of Dynamic RAM,

this is equivalent to 32S, if the diagnostics finds less than 32 seconds the word FAIL will appear in the display.

When the equipment is finished performing it's self test the words "NO TEXT" will scroll from right to left until the first recording is made.

The memory test can be repeated prior to text being recorded by pressing "Replay S/B".

INDICATORS.

Voice Stores each voice store has two leds to show it's status.

GREEN	Play led.
RED	Record led.

A Store in use is indicated by a green led on it's front panel, a corresponding red led being illuminated indicates that the particular Store is in the process of being updated and is in the "Record" mode.

Power Supply

RED	indicates "Input Power ON".
GREEN	plus five rail O.K.
GREEN	plus twelve rail O.K.
GREEN	neg five rail O.K.

Control Button functions. 5.1

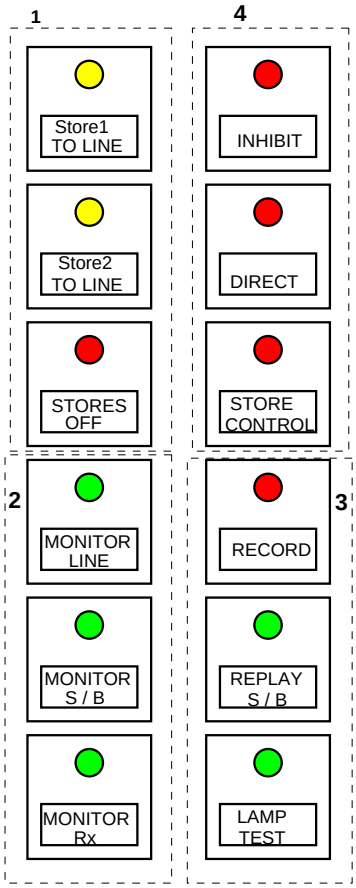
There are twelve Illuminated push button control switches in two columns, they can be grouped by function.

1.	STORE SELECTION	Datis Output
2.	MONITOR SELECTION	Headset Signal
3	MESSAGE CONTROL	Message Recording and check
4	DATIS CONTROL	Executive Control

Group 1

STORE 1 TO LINE. Selects message "1" for transmission.
STORE 2 TO LINE Selects message "2" for transmission.
STORES OFF Disconnects both stores from Datis output.

The store selection controls the priority of the transmitted message.
Note that the three controls are interlocked with the lower button of group 4, the STORE CONTROL.
Datis operation requires that STORE CONTROL be held down while the selection is made.



Group 4

The "Store Control" button has a red indicator that lights while the lock switch is in the "ACCESSED" position. If the controls are "LOCKED" this led is extinguished.

INHIBIT Disconnects all output signals from the unit.

DIRECT Allows transmission of messages direct from the headset microphone. (Interlocked with Store Control).

STORE CONTROL Interlock button to prevent accidental operational changes.

Group 3

RECORD Records headset microphone voice message to the store not selected. (Note that if both stores are "off", the same message goes to both stores.)

REPLAY S/B Replays the message on the standby channel.

LAMP TEST Checks all button lamps when pressed. The lamp test button illuminates all of the leds except the "STORE CONTROL" led.

Group 2

MONITOR LINE Outgoing Datis message to headset.

MONITOR STANDBY Standby message to headset.

MONITOR R/X Datis channel VHF receiver to headset.

CONTROLS and equipment reaction to controls. 5.2

DIRECT (when used in conjunction with the STORE CONTROL button) is used in a type five datis and connects the microphone output direct to the audio buffer that feeds the transmitter. The DA6U6 is a type six datis, the microphone on the headset has insufficient output drive for this function.

The LED indicators in each switch are provided in addition to the Alphanumeric displays on the DA6U6.
Other types of Datis are remote controlled with the same switch panel at a different (remote) location from the main equipment. In that case the LED indicators provide confirmation of what function has been selected.

The DATIS is controlled by press button switches ("momentary make when pressed") sending plus twelve volt signals to the DLC2 board. The twelve volt pulse is level converted by opto isolators and the majority of the incoming commands are interpreted by the CMOS logic.

The controls may be grouped as follows:-
* Store Selection.
* Monitor Selection.
* Record / Replay.

The first three control groups have "registers" that remember what button has been pressed. Requests for Record and Replay are not stored by the DLC2 but dealt with directly by the voice stores' own logic.

Store Selection.

Three press buttons perform this function:- Store One, Store Two and Off. Pressing a store selection causes an SR type flip flop on DLC2 to change state, resulting in a bar priority line going low (zero volts), the priority signal is an active logic low and hence termed BAR PRIORITY, which is output to the lower backplane.

The DLC2 board causes bar priority one to go low (zero volts) when priority is requested for store one to replay to line. Similarly for bar priority two and store two.

The OFF button cancels any request for priority, causing both bar priority lines to go high ("five volts").

At power up the logic defaults to Stores Off.

Monitor Selection.

Three press buttons, Mon Line, Mon Standby and Mon Rx.

At power up the logic defaults to Monitor Line.
The action of pressing the desired button will cancel the previous selection.
The outputs from this group are termed BLL, BLSB and BLRX respectively.
i.e. BLL = bar listen line etc.

Record and Replay Standby.

These are single press functions without "logic gates" on DLC2, they become inverted and level shifted to five volts.

OPERATING INSTRUCTIONS 6.1

Ensure that the headset is plugged into the LEMO socket.

1) TO MAKE THE FIRST RECORDING

Press the "Record" button, it's led will illuminate confirming system is in Record mode.

The Alphanumeric Display of both stores will show RECD followed by ----.

Once the record button is released the dashes will be replaced by R000 and the digits will advance with passing time. see note (b).

When your message is completed, press and release "Replay S/B", and the RECORD led will extinguish.

Assuming that this is the first recording into an "empty machine" the message will be recorded into both stores simultaneously.

2) "GOING ON-LINE"

The store that is assigned priority will replay it's message to line.

Select Store One by pressing and holding "Store control" and "Store 1 to Line".

3) TO CHECK PLAYBACK OF FIRST RECORDING.

After having finished recording (as described in 1) press the push button marked "Replay S/B". If neither store had been selected, as they are at power on, the recording will have been made on both Stores One and Two simultaneously.

Selection of the Store to transmit first was made at step 2.

The display will show ONLI followed by PLAY.

The green led on the store shows the reproducer status.

The message can be heard in the headphone and will repeat itself continuously.

If the message is satisfactory, and is to be left running no further action is required.

Should you no longer wish to hear the message in the headphone, pressing "Monitor S/B" will produce the desired silence.

4) TO MAKE SECOND AND SUBSEQUENT RECORDINGS

Press "Record", the led will illuminate, and make the next recording.
At this time, your own voice will be heard in the headphone automatically, irrespective of the selection made for the monitor channel.

When you have completed the new recording, press "Replay S/B" once.

The display will show [Rend] followed by [STBY].

If you wish to hear and check this recording, before putting it on line, press "Monitor S/B" followed by "Replay S/B", when you will hear a single transmission of the new message.
If you wish to hear it again, press "Replay S/B"

If the message is not correct, or it is desired to record it again, all that is necessary is to press "Record" again and carry on from the beginning of this section of the instructions

When satisfied with the new message, press the button for the other Store. The led will illuminate dimly having accepted your request, but the changeover to the new message will not take place until the previously running message has come to an end.
This fact will be signalled by the previous Store led being extinguished and the selected Store led changing from dim to full illumination.

Once a Store has been selected in this way, the Radio Transmitter being used for the Atis Service will be automatically keyed to "Transmit".
When any Store is on line, the message will repeat constantly.

5) MONITORING

The operator may select, at will, the signal he wishes to monitor in his headset, from the selection "Line", "S/B" or "Rx" (radio receiver if connected)

Whatever choice has been made, it will be temporarily suspended each time the "Record" is selected. In this mode, the only signal the operator can hear is his or her own voice making the fresh recording.
When recording is terminated, the monitor function reverts to that previously selected.

During normal operation, signals will always be heard if either "Monitor Line" or "Monitor Rx" (if fitted) are selected.

When "Monitor S/B" is selected, signals will only be heard for one message cycle if "Replay S/B" is pressed, otherwise this source will be silent.

Pressing "Replay S/B" causes [VIEW] to be displayed on the store that is off-line,
when the button is released the total length of the message is shown as [V020],
(for a 20 second message) and counts down to [V000]
after which the store reverts to [STBY].

6) TO CLOSE DOWN SYSTEM

a) TEMPORARILY FOR AN OPERATIONAL REASON

Press the button "Stores Off". It will illuminate dimly having accepted your request and only come to full brilliance when the currently running message has finished. In this mode the alarm will be disabled and the transmitter key will be released.

If the shut down is of short duration and/or either of the stored messages is still valid, the system may be restarted by selecting the appropriate Store to Line.

b) FOR A LONGER PERIOD, INCLUDING AT END OF WORKING DAY

Press the button "Stores Off" as before.

To restart:-
i) If either message is still valid, select the valid Store to Line.

ii) If, as is more likely, neither message is valid, proceed to the beginning of these Instructions to the section "To make First recording".

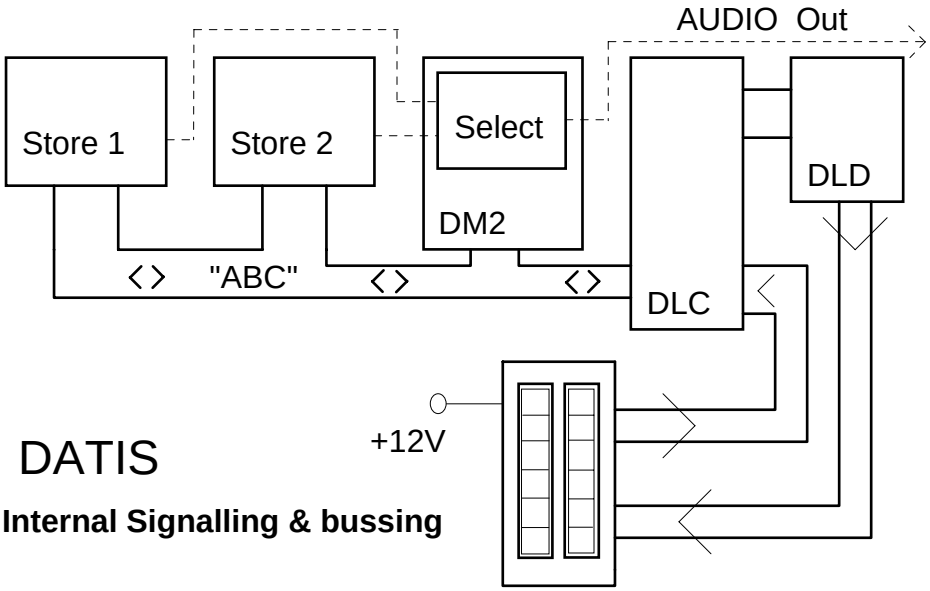
note (a).
If encountering a DA6U6 with either no text or with old messages in both stores, some users have found it useful to erase both stores by selecting Stores Off and then recording a few moments of silence or the words "Test Transmission" (or both).

note (b).
The display shows converted elapsed time (with a positive conversion factor of 2.5%)
When a message is recorded and the display shows R020 the actual text length is 20 plus 2.5% = 20.5 seconds.

note (c).
If the record button is pressed momentarily by chance, (bearing in mind the closeness of the "Store Control" button) the record mode entry delay allows the operator to "change their mind" (by removing finger or thumb) without accidentally erasing the standby message.

note (d).
Pressing and holding the record button whilst recording, temporarily suspends the recording process, allowing the operator to cough or clear their throat without those sounds being recorded.
The display will show ----.

INTERNAL SIGNALLING & BUSSING. **7.1**



Internal Signalling & bussing

Pressing a switch at the panel causes the DLC2 to issue a command onto the Announcer Buss Control, (ABC).

The "ABC" is a bi-directional buss system that takes place on the lower backplane.

The audio output from the voice store that is online is selected and amplified by DM2.

This simplified block diagram represents the active blocks that comprise the Datis.
It shows the two identical voice stores, which receive commands via the lower backplane, the DM2 which uses audio switching and a line amplifier to provide the desired audio from the selected voice store. The DLC and DLD blocks serve as the user interface, with the set of press-button switches.

There are two backplanes in the subrack which connect the plug-in units together to form the entire system.

- Lower Backplane. P11110
- Upper control backplane. P11121

The Lower Backplane conforms to the "P.A. ANNOUNCER BUSS".
This buss conveys three power supply rails: +5, +12, -5 volts, which are used to power the plug-in units. The Lower Backplane connects both signalling and audio which comprises the "ABC", Announcer Buss Control.
There are designated "control pins" on the voice store which are connected to the microprocessor, these "control pins" are routed by the Lower Backplane and each "pin" has a buss name in addition to it's actual pin number.
Where possible, a particular "pin" number is reserved for it's particular function and it is reserved at all plug-in slots.

e.g. BRLD at pin 16, excluding the power supply socket position, all pins 16 are connected together via the backplane and it is termed the BRLD buss.

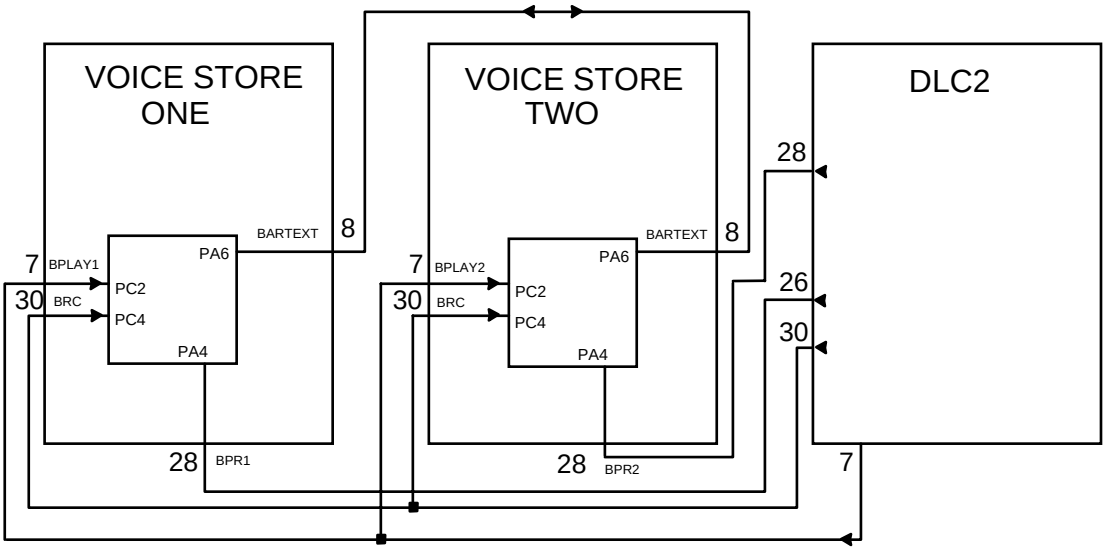
When control signals are sent via the lower backplane they are generally active logic low. i.e. "bar" type signals, (0V true).

Upper control backplane.

Using the same "reserved pin philosophy" that is in use on the Lower Backplane, the pin numbers are bussed on the Upper control backplane.
It connects the DLC2 DLD2 upper connectors pin to pin, accepting each line from the control panel.
Where a pin is used as a pulse input at the DLC2 it will be a no connection at the DLD2, similarly where a pin is used as an indicator output from the DLD2 it will be a no connection at the DLC2.
This is a intentional move to aid the service engineer, to give a specific identity to each connection or line, to aid tracing of signals etc.

VOICE STORE CONTROL.

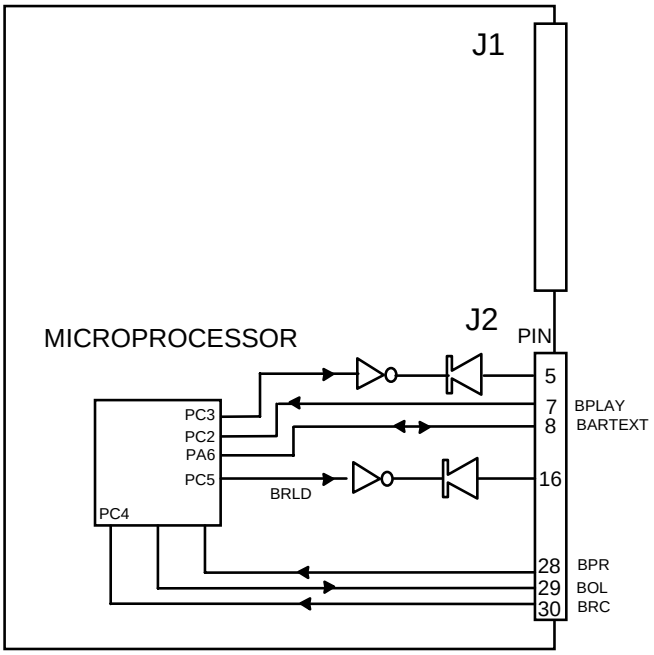
The diagram shows how the ports of the two voice stores are connected to the DLC2.
Pin numbers and port names associated with each interconnection are shown.



Note that the signals BPR1 and BPR2 , which connect at voice store edge pin 28 connect to microprocessor port PA4 on the older voice store (as shown in the above diagram) and to the alternative microprocessor port PB6 on the newer P21028.
The operation and edge pin numbers are unchanged.

VOICE STORE PORTS. 8.1

The system functions by reaction to certain ports of the announcer's microprocessor, called INPUT PORTS, causing other ports called OUTPUT PORTS to change state.



PC2 BPLAY (Bar Play)
PC3 BP* (play led)

The bar play command has two functions, to terminate a recording and to replay the standby store.

BPLAY (Bar Play) port PC2, J2 pin7

The play led is lit when text is being replayed from a store. BP* (play led) is driven by a 7406 o/c driver from port PC3.

The 7406 output is wired to J2 pin 5.

PB7 BOL* (Bar On-line)

A signal is required to activate the line relays, one per store, the signal is called BOL (Bar On-line) and is driven by PB7, it is driven low by the micro when valid text should be transmitted to line.

BOL (on-line) port PB7, J2 pin29 on store pcb.

PB6 BPR* (Bar Priority) and **PA6** BARTEXT

Where * = 1 or 2 dependant upon store.
The announcers are configured as two stores, one for transmission to line and the other as a standby for updating and preparation of a new message.
A priority is assigned to the store that should be transmitting by placing a "low" on a BPR line. The standby store has no priority and will accept a request for recording.

BPR (Priority) port PB6, J2 pin28 on store pcb.

A "communication" path for the two stores' microprocessors is provided by PA6 on J2 pin8. of each store. It is a common line where either micro can pull the level low via the backplane. (wire-or'd principle.) When the transmitting announcer is sending text it will pull the line low, the other announcer will be aware that text is being sent and will not start even if priority has been granted.
This is the method used to determine change-over.

BARTEXT port PA6, J2 pin8 on store pcb.

PC4 BRC (Bar Record) **PC5** BRLD (Bar rec lamp)

Pressing the record button causes a low on both announcers' record lines simultaneously, but the standby store has no priority (it's BPR at PA4 will be high) and will accept the request for recording. The on-line store should ignore the command (since PA4 will be low).

BRC (Bar Record) port PC4, J2 pin30 on store pcb.

The record lamp is lit when text is being recorded into a store.
BRLD is driven via a diode by a 7406 o/c driver from port PC5.

The output is wired to J2 pin16 on store pcb.

VOICE STORE PORTS, continued. 8.2

Inhibit: cancelling a message

The inhibit command requires a single button to be pressed, the result of selecting this command is to energise relay RLE, removing audio and breaking the transmitter keying.

The command is maintained by a J-K flip flop on the DLC2 board.
Pin 10 of the DLC2 edge conn goes low.
The lower backplane carries the logic level to both voice stores (edge conn pin 10).

Voice store Port PA0 monitors the logic level BarInhibit (BIN).

If BIN is low the display of the selected store (the store which has had priority assigned) will show "Inhibit" and will continue to scroll this message until the button is pressed a second time, cancelling the BIN command. (BIN = logic HIGH).

The selected store will restart it's text (spoken message) from the beginning after Inhibit has been cancelled.

Definition
The port description on this and the previous page refers to the later Voice store [P21028] and its associated firmware DA6DM2 or later.

List of ports.

PA0	In	BIN	monitoring Bar Inhibit.	J6 linked 2-3
PA1	In	MAVend	Index the conversion process	
PA3	Out	MAV go	Synchronises conversion	
PA6	In	BARTEXT	Low if a store is transmitting.	

PB0-2			3 lines to select DRAM chip	
PB6	In	BPR	Bar priority.	J3 tracked 2-3
PB7	Out	BOL	Bar on line.	J2 tracked 2-3

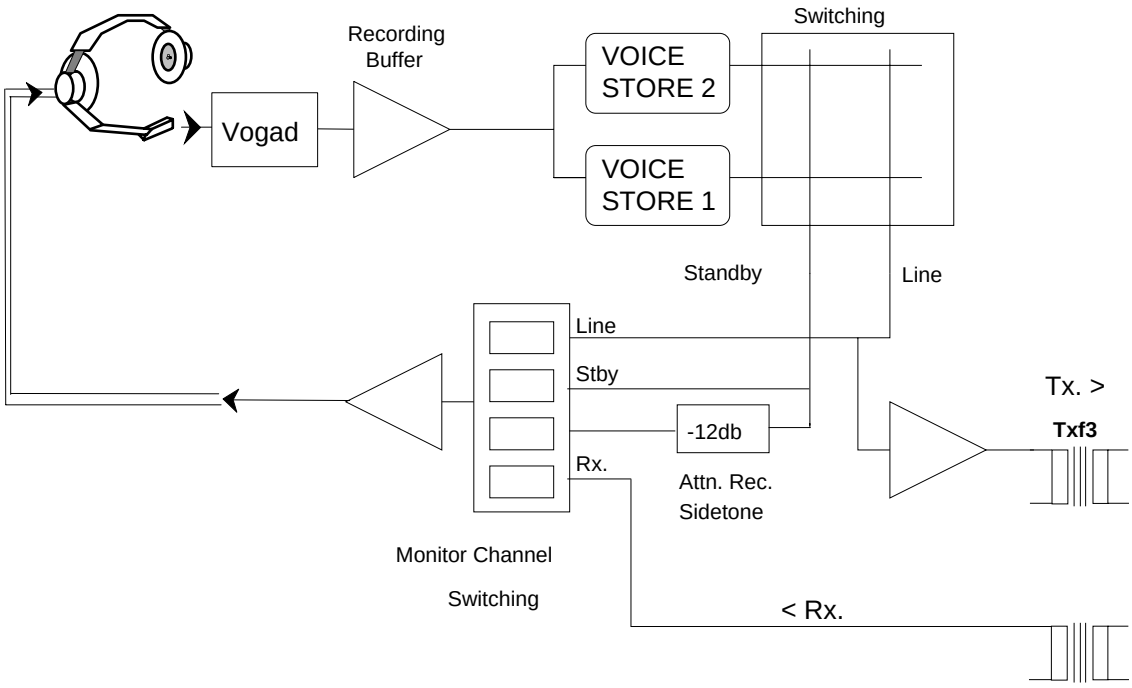
PC0	Out	Audio On	Used to mute voice store audio
PC2	In	BPLAY	Bar play command.
PC3	Out	BP*	Play led.
PC4	In	BRC	Bar record command.
PC5	Out	BRLD	Bar record led.
PC6			A13 address line.
PC7			A14 address line.

PD0-6	Out		7 lines used to select text data area
PD7	Out	Record	audio playback / record control

B21025 Jumpers for P21028

J2 as tracked 2-3
J3 as tracked 2-3
J4 no link fitted
J5 link soldered between 2-3
J6 link soldered between 2-3
J7 no link fitted

AUDIO SIGNAL PATH. 9.1



Recording

The signal from the operator's microphone passes to the VOGAD preamplifier in DM2, where level fluctuations are reduced, the resulting output has an average level of -20db and is fed via the recording buffer to both announcers' input lines simultaneously.
The store that makes the recording is determined by both the priority and presence of the record command.

Store

The store can both record and reproduce.

The audio output of a store is from pin 14+15 of the lower connector of the store, this signal is fed to the DM2 via the lower connector of the DM2, J2.
(J2,19 from Store one, J2,12 from Store two.)

DM2 Datis Module.

The Datis Module connects the audio output of the selected store to the line amplifier.

The line amplifier has a gain control located on the DM2 front panel, a screwdriver operated preset control marked "Line adj.", which is used to set the audio level fed via transformer **Txf 3** and to the line for the Radio Transmitter.

The range of this preset is nominally 20dB, adjusting from neg 20 to plus 2 db. The equipment leaves the factory set for neg 13db.

The connector for the operator's headset, an eight pin LEMO type, is positioned on the front panel of the DM2. The messages are prepared locally, rather than from a remote headset.

The DA6U6 is designed to key the transmitter using the audio pair. When the transmitter is required to send (TX ON) a low resistance loop appears across the pair.

DM2 Datis Module. 9.2

The audio output transformer, **Txf 3**, has a split secondary which has the A.C. circuit completed with a 2u2 capacitor. The keying contacts operate the transmitter, by placing a short circuit across the 2u2 capacitor.

The level (and endurance whilst playing) of the line signal is checked by the alarm circuit connected to the line output.

Monitor Channel.

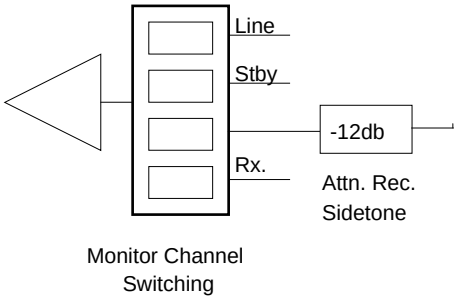
The signal fed to the operator's headphones is from the Monitor channel.
It is driven by a separate buffer amplifier so that headphone loading does not affect the level of signal transmitted to line.
The buffer amplifier gain, hence the loudness of the headphones can be adjusted by a preset control on the DM2. (VR9 SET MONITOR).

The three press buttons, Mon Line, Mon Standby and Mon Rx. are used to select what is heard in the headphones.

The button press is "stored" by the DLC2, and results in one of the following command lines being sent to a logic low. These control signals are input to the DM2 via a pin of it's connector P2 :-

	Description	DM2 pin no
BLL	Bar Listen Line	15
BLSB	Bar Listen Standby	14
BLRX	Bar Listen Receive	13
BRLD	selects recording sidetone (when in record mode)	16

The control signals are conditioned and each drives one element of U3, the CMOS transmission gate (type CD4066) which turns on and connects the desired signal.



Monitor Channel Switching

Attenuators are used on the two switch elements which select standby store and sidetone to normalise all four to the same level as set by VR9. (to typically neg 13db.)

Level Indicator.

The bargraph type indicator is switched by the rotary switch on the front panel of the DM2. It should only be used as a guide to audio levels since each switch position has a different gain setting. The switch positions are :-

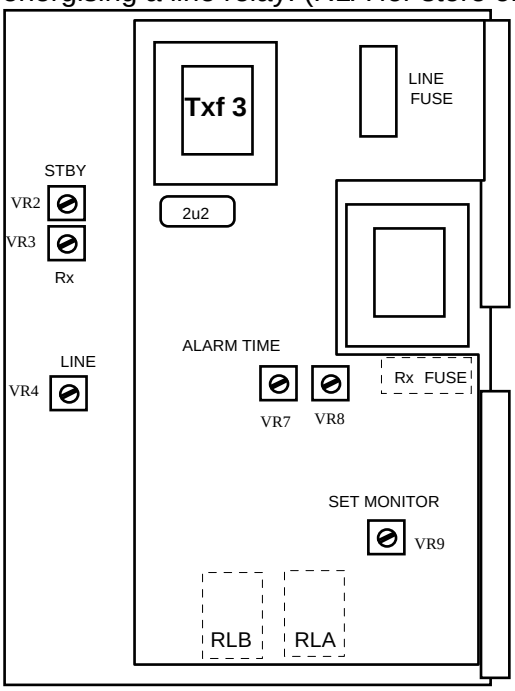
LINE	Level being transmitted to line.	Led0 rep 0db.
I/P	Microphone level after VOGAD.	Led0 rep -20db.
RX	Signal from off-air receiver.	Led0 rep 0db.
STBY	Message Level in the standby store, (press replay S/B to monitor).	Led0 rep -3db.

DM2 Datis Module. (continued) 9.3

There are two revisions of the Datis Module DM2, both are interchangable the older type uses relays to select the store to line the later type employs electronic switching.

Old Type P11270.

The Datis Module connects the audio output of the selected store to the line amplifier by energising a line relay. (RLA for store one and RLB for store two).



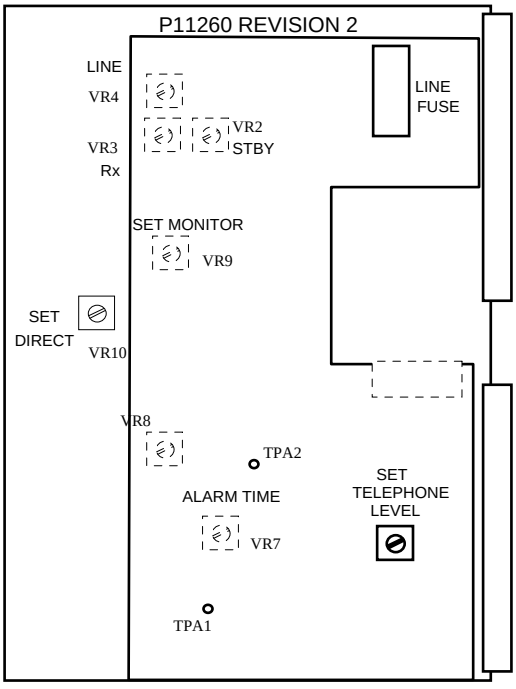
The audio output transformer, TXF3, has a split secondary which has the A.C. circuit completed with a 2u2 capacitor.The contacts of either RLA RLB are used to key the transmitter, by placing a short circuit across the 2u2 capacitor.

Monitor Channel.

The buffer amplifier gain is set by VR9 on the DM2 daughter board.

New Type P21270.

Can be identified by "P11260 REVISION 2 " written in the silk screen legend at the top of the board.



Improvements.

- The Datis Module connects the audio output of the selected store to the line amplifier by electronic switching (rather than using relays).
- Faster acting alarm - digital rather than analogue sensing
- Provides monitor signal even if no store is online.
- Has gain control to set Telephone level to neg13 db.

AUDIO LEVELS and ADJUSTMENTS. 9.4

Recording
The signal from the microphone is processed by the VOGAD, U5 on DM2, passes via U4 to the backplane on pins 21 and 22 as a balanced signal.
Both VOICE STORES accept this via pins 23 and 24 of P2, the coding level is set by R29 which is a factory set preset not normally requiring adjustment (see Input Level below).

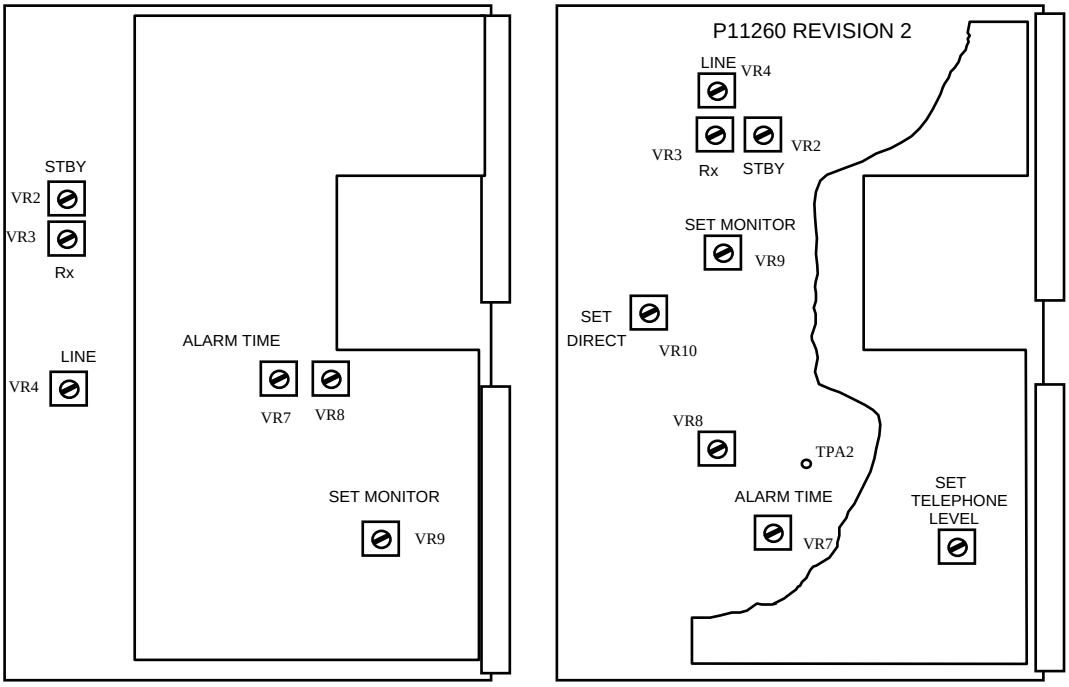
Voice stores.
There are two adjustments on the voice store plug in units,

Output level set to -3db measured at pins 14/15 of P2 of voice store.

Input level factory set for correct A to D coding.
relates to a maximum of 128mV input to the codec.Measured as 125mV rms using a high impedance meter or scope at the junction of C9 and R27.

Datis Module, DM2.

VR1 Front panel adjustment of level to line.
set to suit level sent to line for ATIS transmitter,
nominally set to neg 13db on leaving factory.



Indicator normalisation presets, VR2 - 4.
Three preset controls to determine test indicator reading for a particular switch setting.
VR2 adjusts Stby. (to have a gain of +3db)
VR3 adjusts Rx. (to compensate for barrier losses.)
VR4 adjusts Line (set to indicate actual line output level.)

(VR5 and VR6 are not fitted to a type 6 DATIS.)

VR7 "ALARM TIME"
VR8 Alarm sensitivity.

VR9 Monitor Level adjusts audio level delivered to the headset.
VR10 Direct Level adjusts relative audio level to transmitter when in Direct Mode. (set to max.)

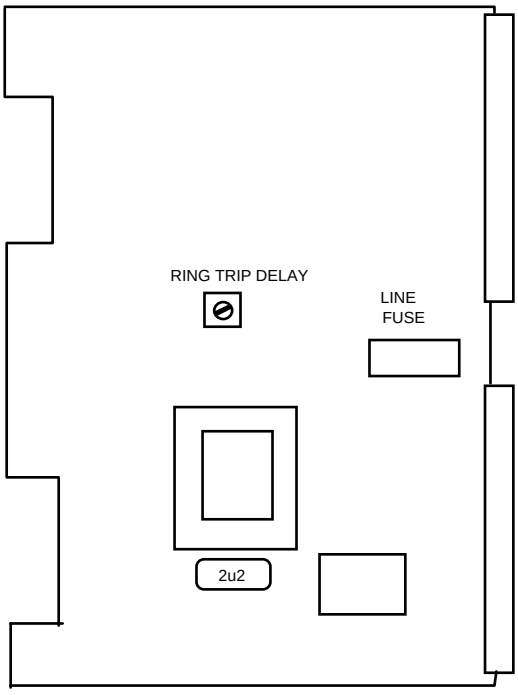
TELEPHONE LINE INTERFACE 10.1

The Audio Output for transmission and the "off-air" receiver input have telecommunications line interfaces, approved by B.T. in order that distant transmitter or receiver sites may be used. These interfaces are a function of the Audio and Routing Module, LF.

TELEPHONE ACCESS TO MESSAGE

A separate line interface is provided, presented as a two wire connection on a pins 2 and 5 of a standard U.K. telephone cord which can be plugged into an analogue P.A.B.X. port, or into a 431 jack being a Network Termination Point of the P.S.T.N.
(Public Switched Telephone Network operated by British Telecom, Mercury and the City of Hull).

When 75V 25Hz. ringing current is offered to the interface it is applied to the ringing current detector, which has an A.C. input impedance in excess of 5,000 ohms.
The interface "answers" the call by "placing a low impedance loop" across the telephone line ("off-hook" condition).
The audio signal (the announcement text) appears on the two wires of the telephone line as a balanced signal.



At the end of three messages the interface "disconnects" and reverts to a high impedance state with no D.C. path ("on-hook" condition).

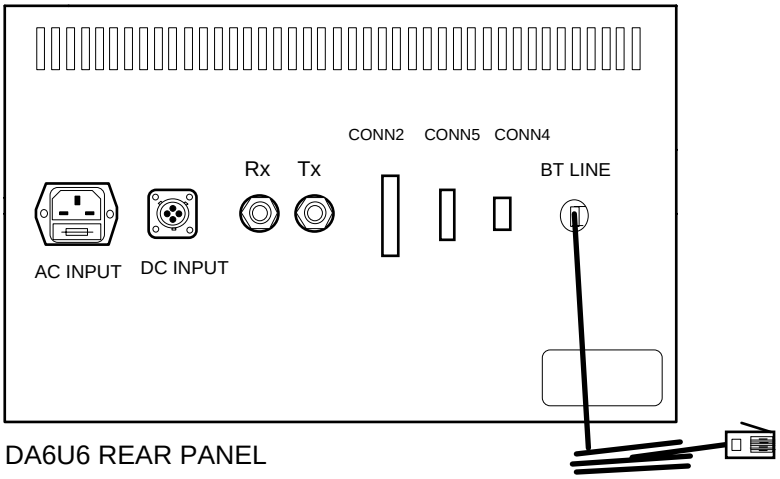
In this respect it behaves as if it were a simple telephone as described in BS6317.

A caller will hear the current transmission a maximum of two times, following which the call will be disconnected by the DA6U6.

If the message is being inhibited or there is no store selected to be transmitted (Stores Off-Line) the telephone interface will not answer an incoming call.

CONNECTIONS. 11.1

Connections are made to the rear of the equipment sub-rack and are presented as the diagram below.



DA6U6 REAR PANEL

SKT1	240V A.C. Input	IEC mains connector.

SKT2	24V D.C. Input.	Four pole Burndy.
	pin A	plus
	pin B	no connection
	pin C	minus
	pin D	no connection

SKT3	Rx	P.O. Jack Type B

(see note 1 below)

SKT4	Tx	P.O. Jack Type B

(see note 1 below)

SKT6 (Conn2)	Facilities	25 (25 way "D" connector.)

(Provided for connection of PATSI unit)

Conn4	Alarm	DB9 (9 way "D" connector.)

Telephone cord	Plug to suit 431 jack

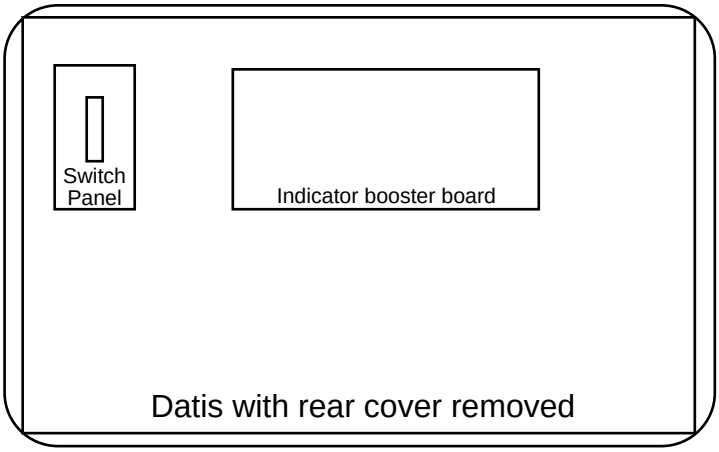
Note 1.

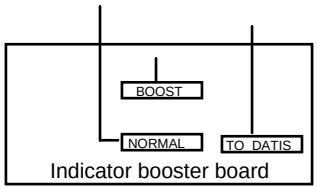
P.O. Jack Type B = RENDAR R22829000 or equivalent.

Facilities Socket and Indicator Booster Board 12

The "Navy" modification provides a facilities socket on the rear of the Datis,which is intended for connection to a "PATSI" Datis interface unit that allows EDDS to remotely prepare ATIS broadcasts.
EDDS takes full control of DATIS when the lock switch on the front panel of DATIS is in the LOCKED position. The PATSI interface "operates" the press button controls and observes the indicator leds.

To provide the facilities socket it is necessary to have a factory fitted indicator booster board in the rear of Datis, on mounting pillars behind the upper portion of backplane.





With nothing connected to the facilities socket the Datis should operate normally.
Should it be required that for diagnosis purposes the facilities socket and indicator booster board need to be disabled, it is possible to unplug two flat cables (one db25 from the switch panel and one db25 from the booster board) and bypass the booster board by plugging the flat cable from the Datis backplane directly into the switch panel.

Glossary.

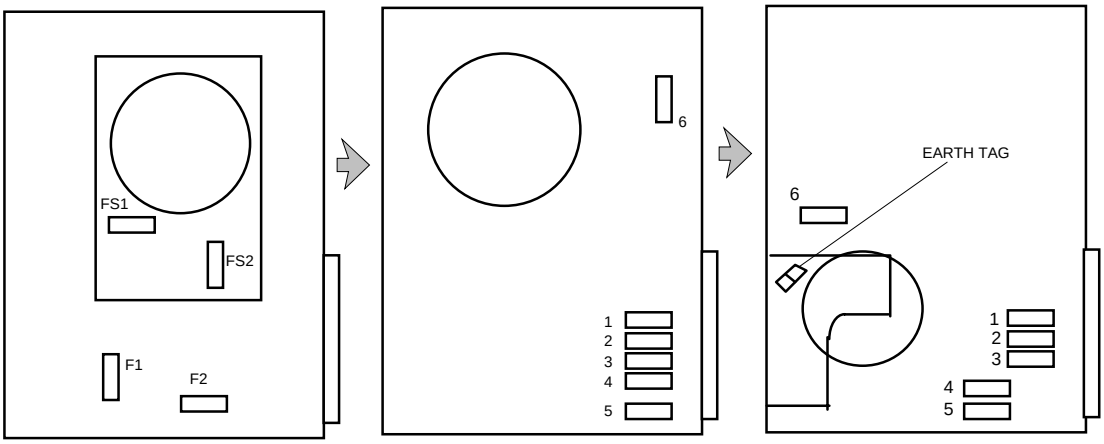
Announcer	Digital recorder and reproducer, also known as Voice Store	
Barrier	protection barrier for telecommunication circuits.	
Codec	Integrated circuit (chip) used in voice store for analogue to digital (and vice versa) conversion.	
DLC2	Datis Logic Control	Interfaces to press switches.
DLD	Datis Lamp Driver	for Leds in switch panel.
DM2	Datis Module Two	Electronic module that performs the Audio Routing function for system.
DRAM	Dynamic Random Access Memory these are the components used to store the digital samples.	
EPROM	Eraseable Programmable read only memory - firmware. used for storage of control program.	
LED	Light Emitting Diode	

Appendix

Versions of plug in boards

The DA6U6 is a product that has been supported since 1990, there have been improvements made to various plug in units, it is not desirable to use “old board” in a “new unit” but all are plug compatible and no damage will ensue.
This appendix looks at the issues and identifies versions of plug in units.

LA : Power Supply Unit

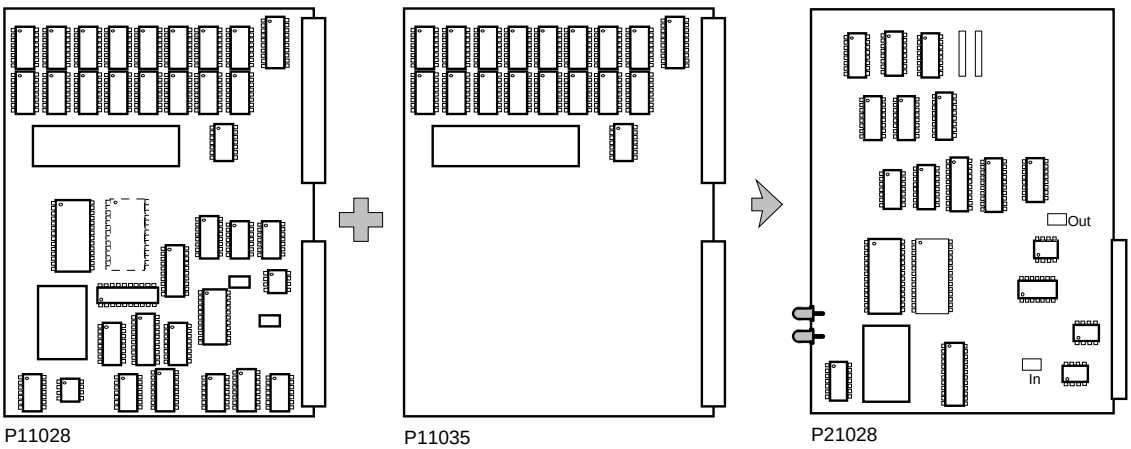


S33017 S33751 S33018

See page 7 for more details.
Improved Thermal Spec, Zero rail Isolation, Lower centre of Gravity

LB, LD : Voice Store

The original P11028 required a P11035 Memory expansion card to obtain a capacity of 128 seconds, new DA6U6 have the single card solution P21028.



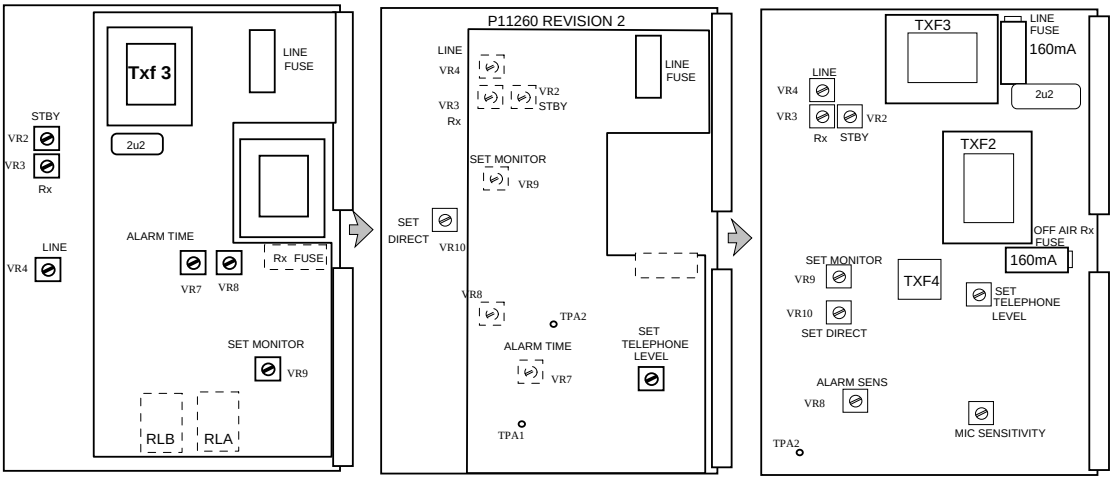
P11028 P11035 P21028

New and old voice stores can co-exist in the same unit.
If replacing a old voice store with a new one it is prudent to remove the redundant Memory card which may be returned to PA Communications at Stewkley for disposal.

Appendix

Versions of plug in boards (continued).

LF : Audio Routing Module



P27260

See page 22 for details of the first two versions.

The P27260 is a single board solution, the “piggyback board” of previous versions has been adsorbed into the main electronics.

The alarm circuit is provided with a PIC 16C84 microprocessor that has the time parameter pre-programmed, eliminating the need for VR7 to set the alarm time.

A new control, P2, is provided to “fine tune” the operator’s headset microphone sensitivity. Since the circuit includes an audio limiter in the microphone pre-amplifier this control is rarely used, but can overcome problems of pick up when the DA6U6 is used in a physically noisy environment.

Appendix 2

There is a Safety Notice on the rear panel of new equipment as follows :-

! Warning - **FOR YOUR SAFETY !**

To prevent electric shock do not remove covers. No user servicable parts inside.

This unit must be earthed. Read installation instructions before connecting to the supply.
Only use the correct rating and type of fuse.
Servicing must be carried out by suitably qualified personnel.

"To prevent electric shock do not remove covers.
No user serviceable parts inside."

Although insulated, there is mains wiring inside the box, if not trained, you might not recognise the dangers involved

"This unit must be earthed. Read installation
instructions before connecting to the supply."

A major factor in maintaining a safe operating environment is the provision of correct earthing, this is provided via the supplied mains lead which has one pin dedicated to this purpose.

Only use correct rating and type of fuse.

See drawing and details on page 6

Servicing must be carried out by suitably qualified personnel.

If you are not absolutely sure that you know the correct technical procedure, then ask someone who is qualified. Do not tinker. If you are qualified then the information you require is to be found in this book.

Note for qualified personnel.

The DA6U6 has an internal earth bonding cable [as yellow / green cable to strategic points]
When re-assembling following service or inspection take care that removable parts have their earth connector refitted using the supplied 0.25 blade connectors.
This particularly applies to top and bottom covers, switch panel and the power supply unit all of which have flying leads to blade connectors.