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P.A. COMMUNICATIONS
ANNOUNCER SYSTEM

Model;   DATIS Type DA3U6
(Refreshed 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.

INDEX

Filename = DA3MAN6a2.pdf

Issue A   1st October 2010 revision2

1. EQUIPMENT: An Introduction

DATIS, DA3U6 is an ATIS recorder, providing an Air Terminal 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 DA3U6 is the technically refreshed DA6U6, it is presented as a 3U height sub-rack, both this and it's predecessor, the DA6U6 are operated at the front panel controls, on the right hand side of the equipment.
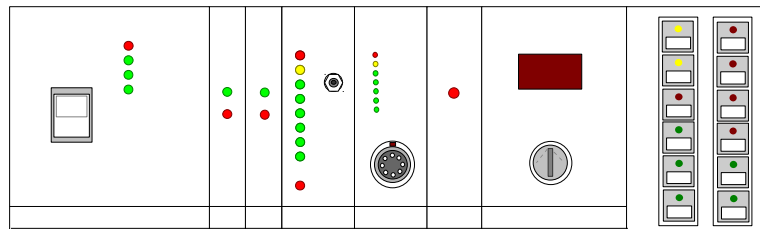
There is a type 3B LEMO connector on the front panel for the user's headset.

The Alphanumeric Status Display has been rationalised on the DA3U6 design, to indicate what the equipment is doing any any particular time. The older DA6U6 has one display per voice store, requiring that the user be more aware of how the equipment is intended to operate (since the DA6U6 gives the status for both stores simultaneously.)

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 P. A. Communications "DATIS" provides a continuous flow of spoken information by replaying a recorded message. The process of storage and replay of the text involves NO MOVING PARTS.
**NATO Stock No. 5835-99-378-4854**

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.

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.
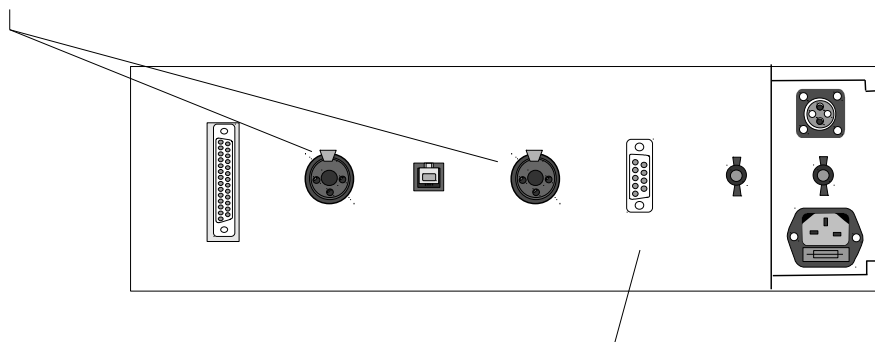
PA manufactures an accessory for Datis that expands the single "Tx" output, providing two isolated transmitter-keying pairs. The **Active Keying box** can be powered from the db9 connector on the rear, it consists of two identical transmitter keying interfaces, each driven by it's own audio buffer amplifier to provide isolation and to allow compensation if different sensitivity transmitters are in use.

1.2   SYSTEM OVERVIEW
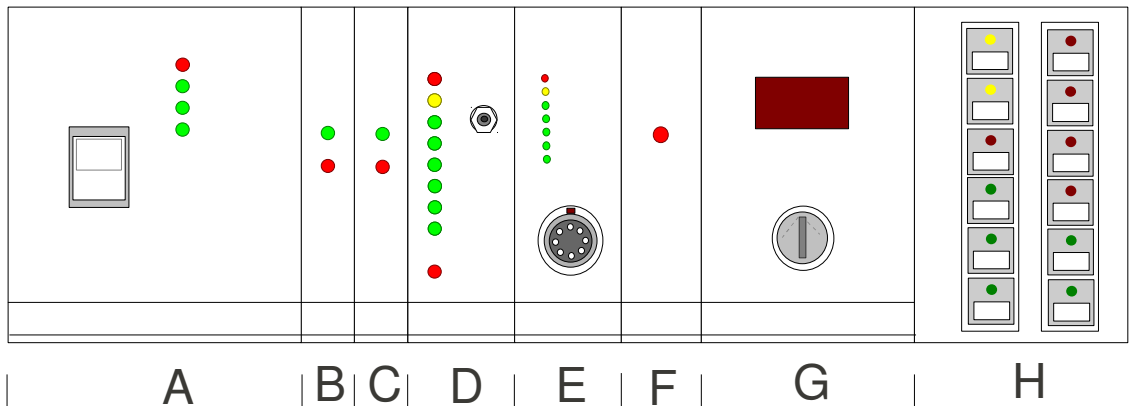
| Plug-In Unit	Part Number	Description
A	S33145	Power supply which supplies plus five, plus twelve and negative five volts.
B	P15160	The first of two identical voice stores.
C	P15160	The second of two identical voice stores.
D	P15375	Transmitter Interface
E	P15460	Operator Audio Interface
F	P15327	Ring Trip Telephone line interface board.
G	P15700	Status Module and Lock Switch.
H	P15684	Switch panel (controls), Local Control Interface, **Datis Control**
J	P15682	Remote Indicator Driver, **Behind H**

Notes:

A
To remove the Power supply, A, from the sub rack, the earth link should be unscrewed at the wing nut on the rear of the plug in unit.

J
To remove the Remote Indicator Driver, J, from the sub rack it is first necessary to unscrew and extract the **Datis Control** plug in unit H.

1.3   SYSTEM OVERVIEW (continued)

Store1   Store2   Tx Interface   Datis Control
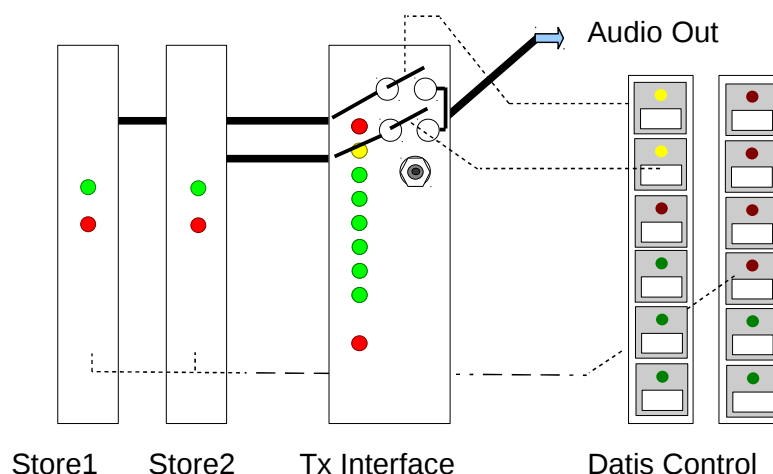
The DATIS has two message stores allowing one store to be operational and the second to be prepared for the next message. Changeover, when initiated, will occur at the completion of the message currently being transmitted.

Messages, of up to two minutes in duration, 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.

1.4   Features of the Type DA3U6 DATIS.

Equipment practice	Standard Euro cards installed in a 19 inch sub rack, housing 3U height plug in units. Card depth 160mm.
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	10 Watts.

2   VOICE STORES
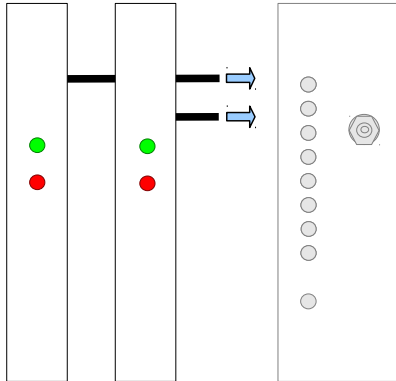
The variable text voice store cards used in the equipment are two identical 3U plug in units.

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 DA3U6 is kept powered to store the text.
When the DA3U6 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 embedded control firmware is a vital part of that process and is unique to a particular type of Datis.
e.g. The DA3U6 control firmware observes the Bar Inhibit line to ensure that complete bulletins are heard following an INHIBIT command.

3   POWER SUPPLY

The DATIS range of equipment use standard size plug in units according to the sub rack size, so the DA3U6 has a 3U power unit.
This DA3U6 is fitted with an A.C. power source that has an auxiliary D.C. input.

The DA3U6 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 on the output winding. The auxiliary supply of negative five volts is generated from a separate winding on the ferrite cored transformer.

Isolation (from earth) is provided by the either mains or switching transformer (or both) dependant upon the power source in use, which would allow the zero volt terminal of the power supply to be internally connected to both mains earth and chassis, an RC network of 1K0 and 100n in parallel is provided as this "link" - to minimise pick up of mains hum and noise while recording.

FUSES - locations and values.
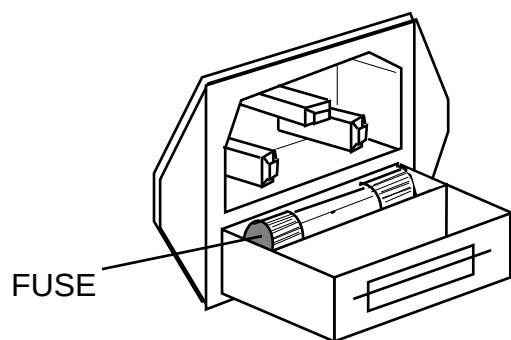
On rear of DA3U6.

Mains fuse,   inside IEC receptacle

20mm type 3.15 A M

FUSE

Both the mains power and earth bonding link should be removed from the rear before removing the PSU, then unscrew the four front panel screws of the plug in unit LA, and withdraw at the front.

The DA3U6 plug-in unit has its mains transformer fitted in the left hand "module", together with the DC input switching diodes and "raw supply components" on the rectifier board.
The DC to DC converter printed circuit board slides into a second set of card guides, to the right of this, but the whole assembly is withdrawn as one plug in unit.

The left hand "module", extends to the rear of the equipment sub-rack and houses both of the power input receptacles.

In addition to the mains fuse that is positioned inside the IEC receptacle "drawer", there are three fuses on the rectifier board and a further three on the DC-DC convertor "main board".

3.1   POWER SUPPLY   (continued)

The DA3U6 employs a single "plug in module" power supply unit, accepting both A.C. and D.C. input power, offering ground isolation from either power source with automatic changeover between the dual input sources.

Fuses

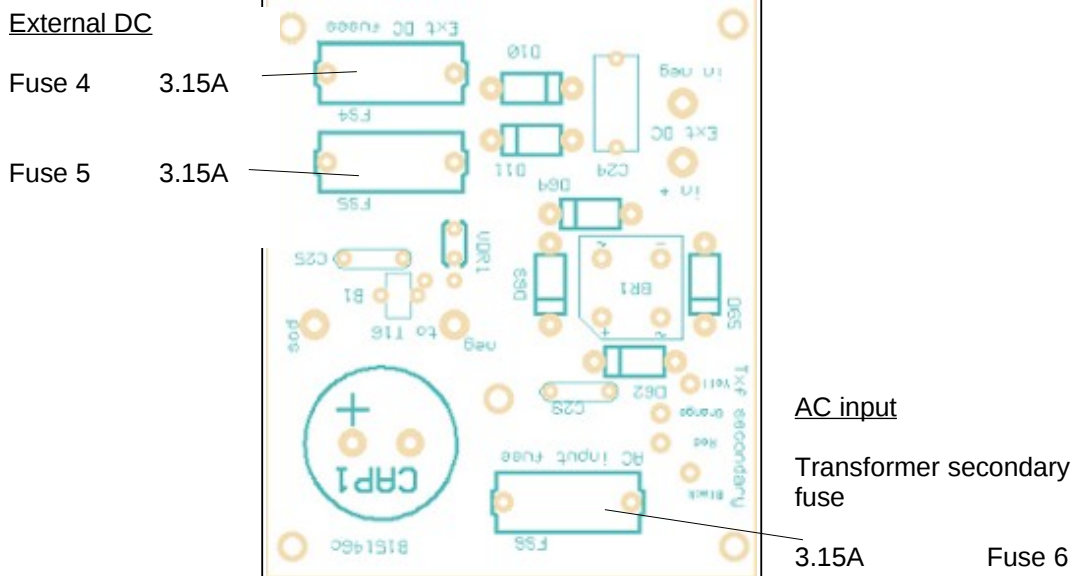| 12V | 2A F |
| 5 V | 5A F |
| neg5 | 200mA F |
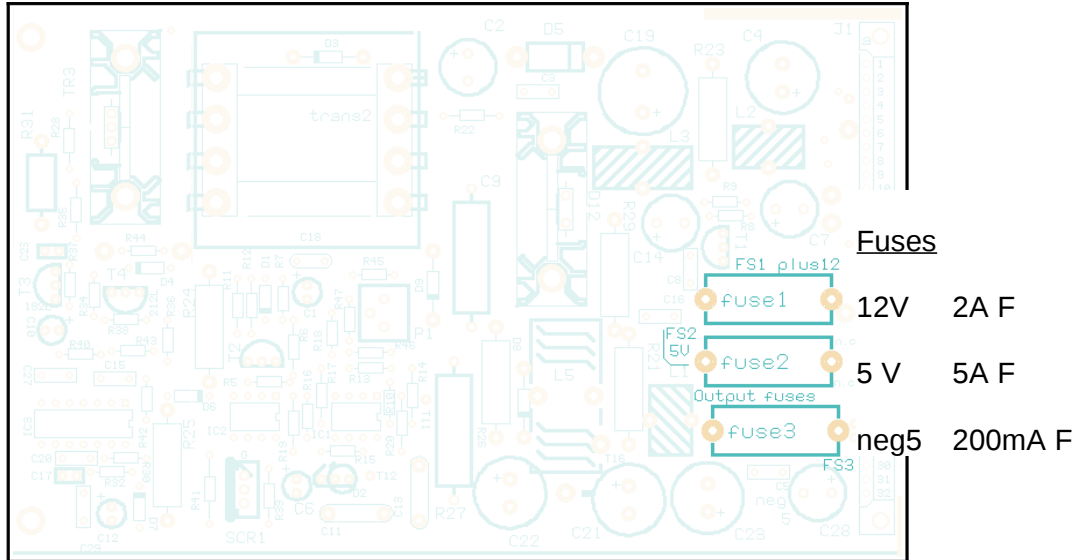
FUSES - locations and values.
There are three fuses on the DC-DC convertor "main board" (above) and a further three on the rectifier board (illustration below).

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	AC input	3.15 A F

Rectifier board inside left of PSU Module

External DC

Fuse 4   3.15A

Fuse 5   3.15A

AC input

Transformer secondary fuse

3.15A   Fuse 6

4   INSTALLATION and COMMISSIONING

CONNECTIONS.

The DA3U6 is contained in a 3U sub rack.
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 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).
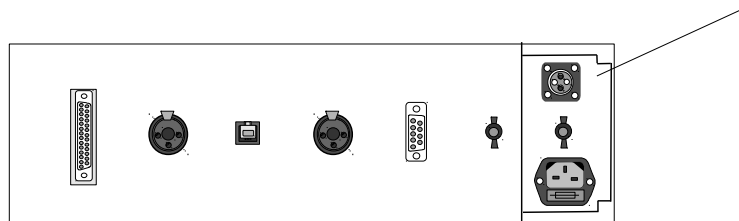
The printed circuit board on the right hand side, S33145 is a 40 Watt **isolated DC-DC** converter type, the output is derived from a ferrite transformer, allowing both auxiliary D.C. input terminals to "float" with respect to zero volts and chassis.

The pinout of the four way connector at the rear of the DA3U6 is as follows:-

Pin A	plus
Pin B	No connection
Pin C	minus
Pin D	No connection

4.1   CONNECTION OF AUDIO LINES and TRANSMITTER.

Connections are made at the rear of the equipment via two Combo Jack sockets that accept either XLR or 5.25 "stereo" jack plugs.

Normal 5.25mm   "type B" plug   XLR

No Connection   Line   Line   No Connection   Line   Line   Line / Line
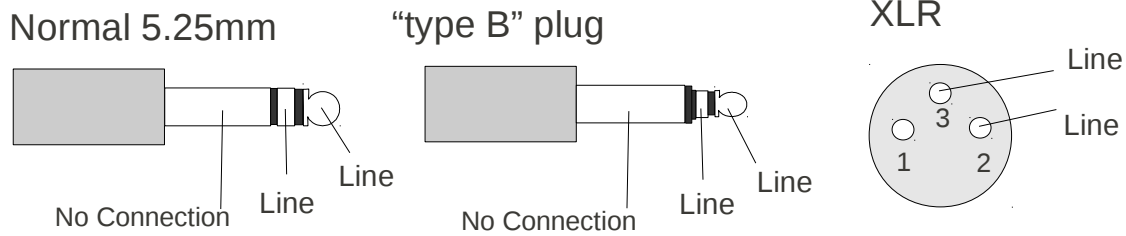
The DA6U6 employed a "type B" jack plug, which is **not recommended** for use in the combo jack, although a rubber washer can be used to position the smaller gauge correctly so that contact is made, the "type B" plug fits loosely.

The best connector is the XLR type which makes good use of the locking button on the combo jack.

At the rear of the DA3U6 are two Combo Jack Sockets, one is for connection to the transmitter, the other is an input which accepts an audio pair from a monitor receiver (this signal is fed to the Operator Audio Interface via it's own fuse disconnection barrier).

RX   input for audio from "off air" receiver.

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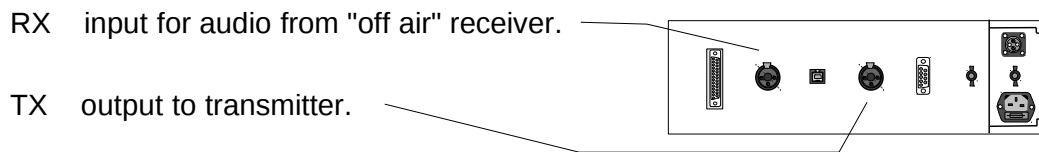
The Audio Output is designed to key the transmitter using the audio pair. When the transmitter is required to send (TX ON) either RLA or RLB contacts provides a low resistance loop.

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.
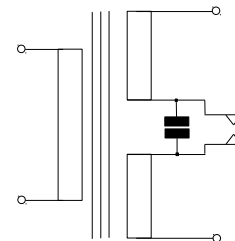
The Transmitter interface plug in unit has a screwdriver operated preset control on it's front panel, this is used to set the audio level sent down the line to the Transmitter.

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.

4.2   INSTALLATION : PRELIMINARY TESTS

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.

During initialise, a message will scroll through the display that denotes the model number.

The display then shows the words "NO TEXT" indicating that both voice stores are empty until such a time as the first recording is made.

INDICATORS.

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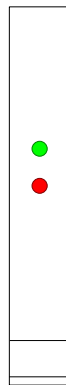
Each voice store has two leds to show it's status.

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 twelve rail O.K.
GREEN   plus five rail O.K.
GREEN   neg five rail O.K.
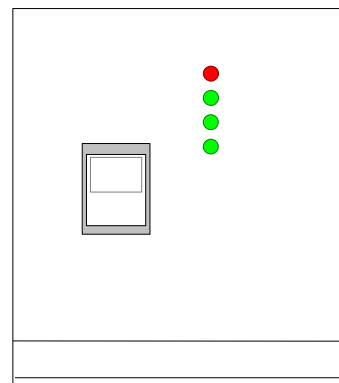
5 Control Button functions

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
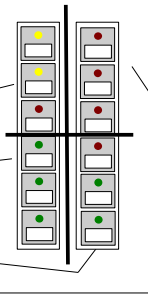
Group 1

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.
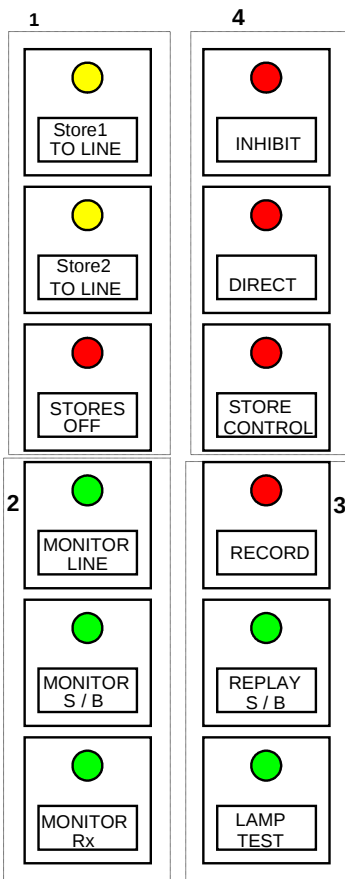
Group 4

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	Used to end recording and to Replay the message on the standby channel.
LAMP TEST	Checks all button lamps when pressed.

Group 2

MONITOR LINE	Outgoing Datis message to headset.
MONITOR STANDBY	Standby message to headset.
MONITOR R/X	Datis channel VHF receiver to headset.

5.1   CONTROLS and equipment reaction to controls.

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 DA3U6 has additional amplification to allow this facility to provide a test signal to the transmitter, albeit at a low level.

The LED indicators in each switch are provided in addition to the Alphanumeric display on the DA3U6.
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 Datis Logic. 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 Datis Logic but dealt with directly by the voice stores' own logic. The registers for Inhibit and direct are located on the Transmitter interface board

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 Datis Logic 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 Datis Logic 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 the Datis Logic, they become inverted and level shifted to five volts.

6   OPERATING INSTRUCTIONS

Ensure that the headset is plugged into the LEMO socket and the DA3U6 is switched On.

1) MAKE THE FIRST RECORDING

Press and momentarily hold the "Record" button, (for about half a second), upon release recording will commence.

The Alphanumeric Display shows . . . .

RECD

Once the record button is released a test message may be spoken into the headset microphone.
e.g. "This is a test broadcast, testing one two three four."
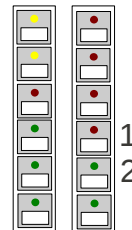
2)

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

Rend

STBY

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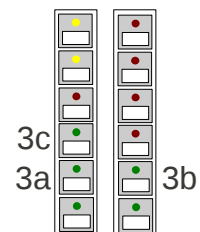
3) CHECKING PLAYBACK

After having finished recording (as described in steps 1 + 2 above)
press "Monitor S/B" and then press "Replay S/B".
          3a   3b

The message that has been recorded can now be checked by listening with the headset, prior to "sending it to Line"

3c
3a   3b

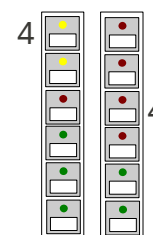3c) Press Monitor Line, in preparation for the next step

4) "GOING ON-LINE"
The store that is assigned priority will replay it's message to line.

4

4

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

The test message will be transmitted over the radio.

The display will show . . . .
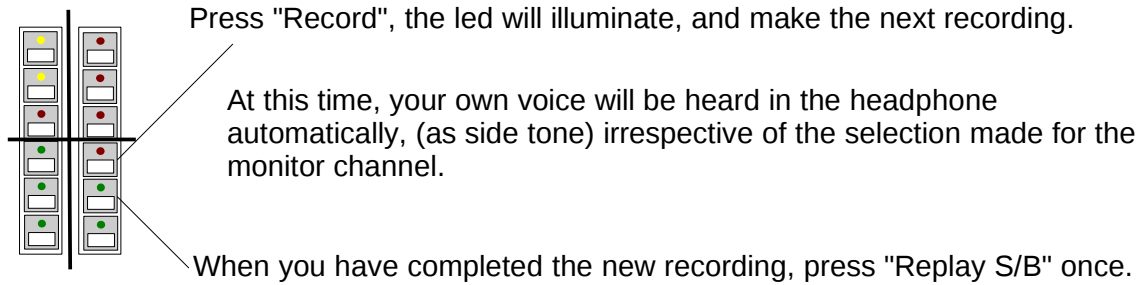
ONLI

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

If the message being repeated 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.

6.1

5) 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, (as side tone) irrespective of the selection made for the monitor channel.

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

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 (5) of the instructions

When satisfied with the new message, press and hold the store control as well as 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.

6) 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.

6.2

7) 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 (i).
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 (ii).
If the record button is pressed momentarily by chance, and is less time than a "normal press" (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.

7 INTERNAL SIGNALLING & BUSSING.

The DA3U6 has a Datis control logic board attached to the rear of the switch panel at the right hand side of the sub rack, pressing a switch on this panel causes the Datis control logic to issue a command onto the Announcer Buss Control, which is a bi-directional parallel arrangement connected via specific tracks of the backplane.

Priority Logic	Indicator Drivers (13)
Monitor Logic	Press Button Interface

Datis Control
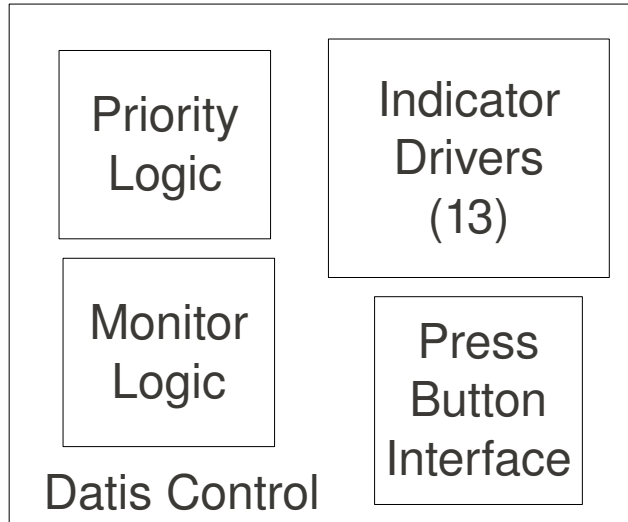
There are two main registers, the

PRIORITY LOGIC, that determines which of the two voice stores has priority for broadcasting it's message,

and the MONITOR LOGIC that selects the audio signal that is heard in the operator's headset.

Ten of the press button indicators are fed from thirteen constant current indicator drivers, three of which provide low level illumination.

The two identical voice stores receive commands via the backplane, the transmitter interface provides the audio switching, selecting the audio from the voice store that is "online". The **Operator Audio Interface** contains the Monitor Channel Audio switching as well as the recording microphone pre-amplifier.

The Datis Control provides the majority of the user interface, from the set of press-buttons.

Backplane Common Routes
An example of common routes are the three power supply rails: +5, +12, -5 volts which are used to power the plug-in units, they connect at each edge connector on the same pin number (the PSU socket differs marginally).

There are also designated "control pins" on the voice store which are connected to the microprocessor, these "control pins" are routed by the 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.

Edge pin Number	Function
1	0 Volt rail
2	Plus 5V
4	Neg 5V
5	Nominal Plus 12V
31	Plus 5V
32	0 Volt rail

e.g. **BRLD at pin 16**,
excluding the power supply socket position and the transmitter interface, 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).

7.1 INTERNAL SIGNALLING & BUSSING (continued).

The audio output from the voice store that is online is selected and amplified by the Transmitter Interface

8   VOICE STORE PORTS.

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.

 BPLAY (Bar Play)

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

BPLAY (Bar Play) port PC2, edge connector pin7

BRV (Bar Review)
The bar review signal goes low while a voice store is replaying (but not to line) it is used to drive the green indicator in the Replay S/B button.

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 low when valid text should be transmitted to line.
BOL (on-line) , edge connector pin29 on voice store pcb.

BPR* (Bar Priority) and 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), edge connector 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, edge connector pin8 on store pcb.

 BRC (Bar Record)   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) , edge connector 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 edge connector pin16 on store pcb.

8.1 VOICE STORE PORTS, continued.

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 backplane carries the logic level to both voice stores (edge conn pin 21).

Voice store Port connected to edge connector pin monitors the logic level Bar Inhibit (BIN).

If BIN is low the display will show "Inhibit" and will continue to scroll this message until the button is pressed a second time, cancelling the BIN command.

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

9   AUDIO SIGNAL PATH
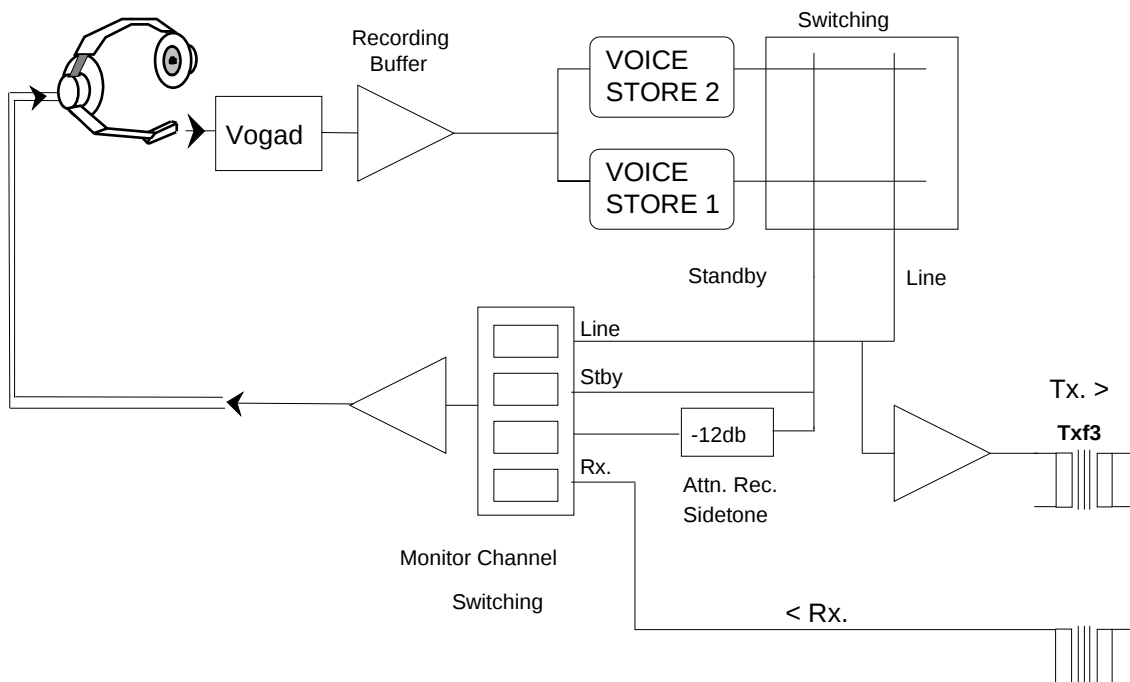
The Transmitter Interface connects the audio output of the selected store to the line amplifier, which has a gain control located on it's front panel, a screwdriver operated preset control used to set the audio level fed via transformer Txf 3 and to the line for the Radio Transmitter.

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.
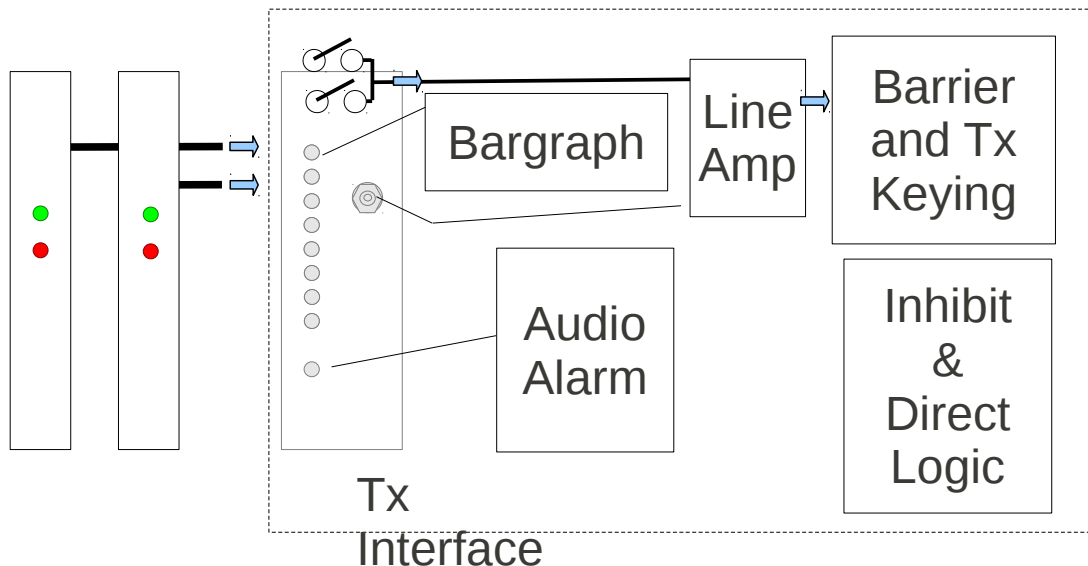
The audio output transformer, Txf 3, has a split secondary which has the A.C. circuit completed with a 2u2 capacitor. The keying contacts operate the transmitter, by placing a short circuit across the 2u2 capacitor, hence when the transmitter is required to send (TX ON) a low resistance loop appears across the pair..

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

9.1   Operator Audio Interface.
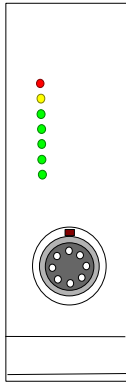
Recording

The signal from the operator's microphone passes to the microphone pre-amplifier in the Operator Audio Interface, 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.

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

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 the load of the headphones does not affect the level of signal transmitted to line.
The buffer amplifier gain, which in turn sets the loudness of the headphones, can be adjusted by a preset control on the Operator Audio Interface. (VR10).

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 Datis Logic, and results in one of the following command lines being sent to a logic low. These control signals are input to the Operator Audio Interface via a pin of it's edge connector.

|	Description	edge 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.

Line
Stby
-12db
Rx.
Attn. Rec.
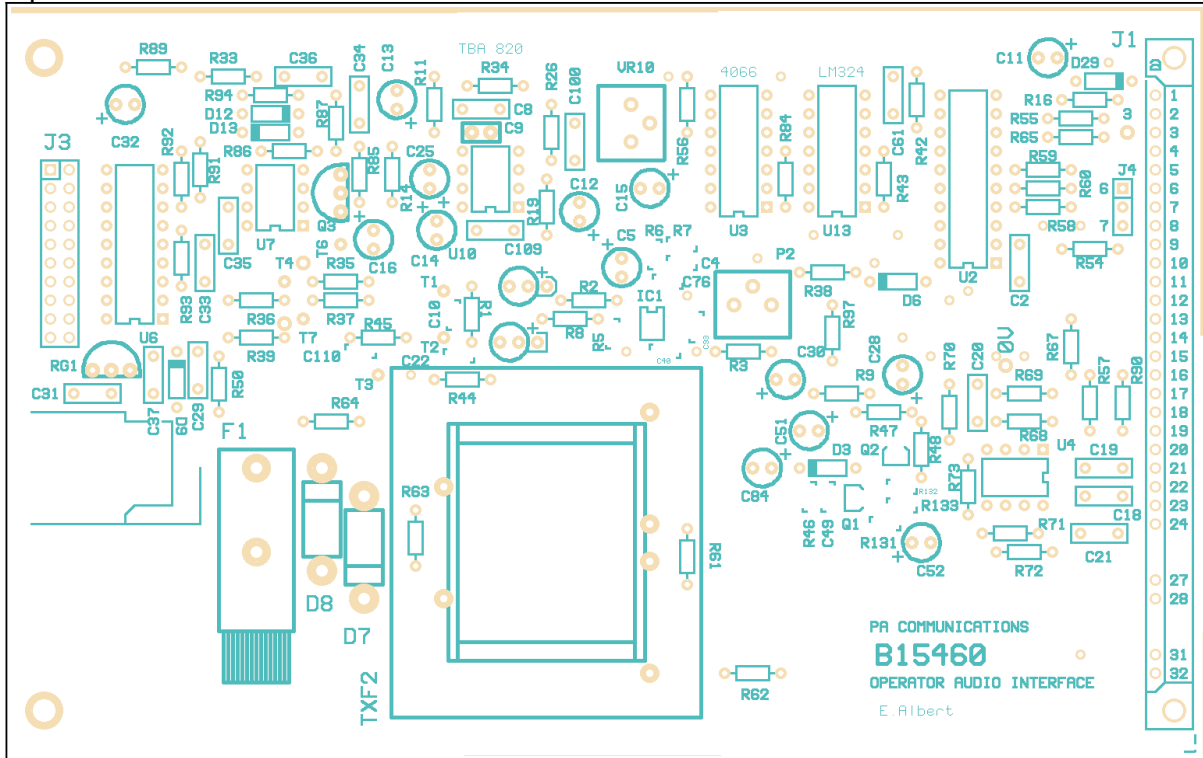Sidetone

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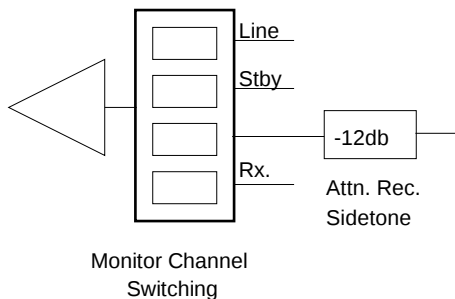
Attenuators are used on the two switch elements which select standby store and sidetone to normalise all four to the same level as set by VR9. (to typically neg 13db.)

9.2 Audio Boards Layout

Transmitter Interface
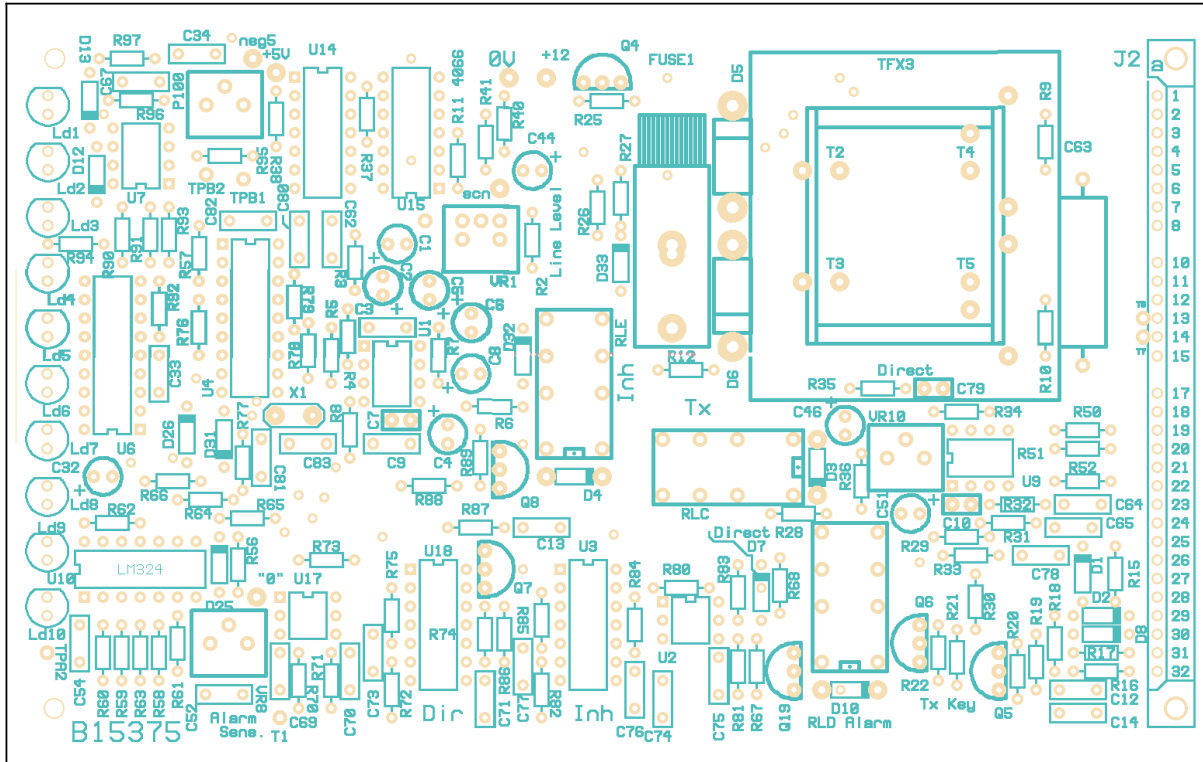
Operator Interface

10 TELEPHONE LINE INTERFACE

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.   The Tx interface is on plug in unit D, the Rx is on plug in unit D.


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.
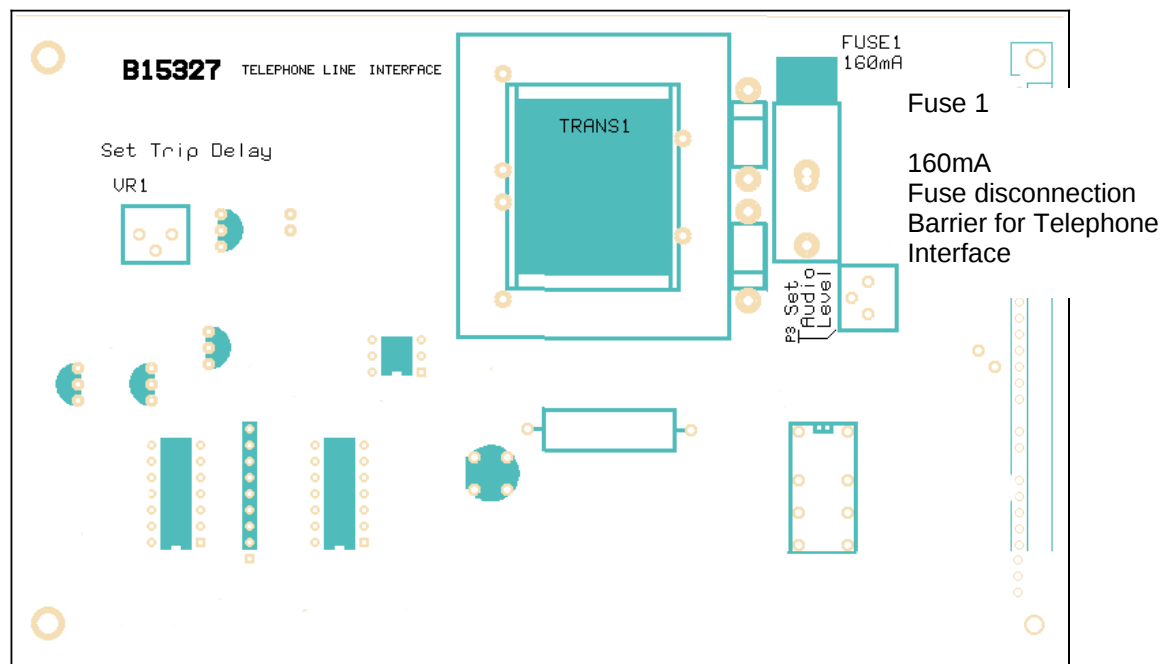
At the end of three messages the interface "disconnects" and reverts to a high impedance state with no D.C. path ("on-hook" condition).
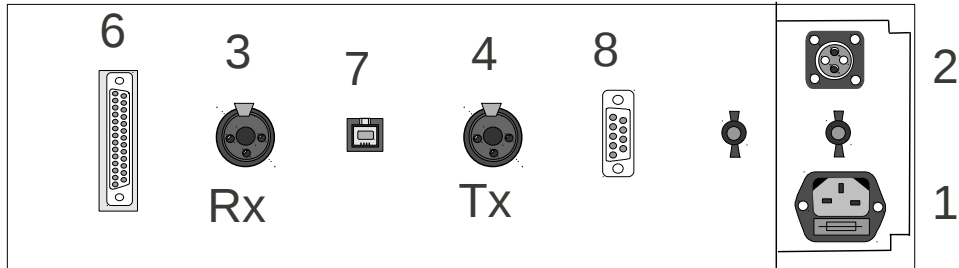In this respect it behaves as if it were a simple telephone as described in BS6317.
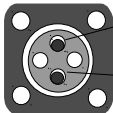
A caller will hear the current transmission a maximum of two times, following which the call will be disconnected by the DA3U6.
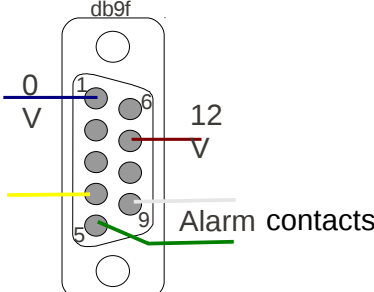
If the message is being inhibited or there is no store selected to be transmitted
(Stores Off-Line) the telephone interface will not answer an incoming call.

11   CONNECTIONS.

Connections are made to the rear of the equipment sub-rack and are presented as the diagram below, the numbering sequence follows the earlier DA6U6.

Socket No.	Function	Type
1	230V A.C. Input	IEC mains connector.
2	24V D.C. Input	Four pole Burndy

Pin A	plus
Pin B	No connection
Pin C	minus
Pin D	No connection

3	Rx – Off air receiver	Combo Jack
4	Tx – Radio Transmitter	Combo Jack 1 X screen 2 L Live 3 R Return
5	Not fitted to DA6U6 or DA3U6	
6	Facilities Socket	db25, provided to connect PATSI unit
7	Telephone	RJ11 (cord terminated with 431 jack) simulates "plain" analogue telephone.
8	Alarm	db9

db9f

0
V

12
V

T7 Key

Alarm contacts

12 Facilities Socket

The "Navy" modification to the original DA6U6 provided the facilities socket on the rear of the Datis, 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.

Plug in board J provides the facilities socket with the "indicator" outputs suitable for a "conn 2" type remote control, it is no longer necessary to have the "factory fitted indicator booster board" in the rear of Datis, that was fitted on mounting pillars behind the upper portion of the DA6U6 backplane.

With nothing connected to the facilities socket the DA3U6 will operate normally.

The facilities socket inputs are "enabled" when the lock switch has been moved to the position that disables the DA3U6 front panel controls.

Technical 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.
DRAM	Dynamic Random Access Memory these are the components used to store the digital samples.
Jack Type B	"Post Office" Jack Plug that conforms to gauge B, BPO316 It has a smaller tip and ring than the conventional quarter inch jack plug – see RENDAR-SCHURTER type R22829000, – Neutrik type NP3-TB-B
LED	Light Emitting Diode
XLR	Generic name for a series of Audio Connectors, originated by Cannon Electrics as their X series with Latch – hence XL The R stood for "rubber compound". Audio engineers use XLR as a memory aid to the use of the three pin variant. Where X=pin 1, L=pin2(Live) and R=pin3(Return) of a balanced circuit.