

ICS

FAX-1 (Mk II) and FAX-1/N

***Weather Facsimile/Navtex/Radio
Teletype Demodulators***

User Manual

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Introduction

The ICS FAX-1 is designed to print radio facsimile weather maps, radio teletype news bulletins and weather forecasts, and Navtex weather broadcasts and navigational warnings. It acts as an intelligent interface between an HF radio receiver and a dot matrix computer printer.

The FAX-1 operates from 12 volts dc at approximately 400 mA. An inbuilt timer permits turns it on only when printing the desired map. By means of external relay switching, this timer may also turn ancillary equipment on and off, such as the receiver and printer.

A 15 LED tuning display enables the receiver to be precisely tuned to the correct frequency. Additional LEDS display the current mode and status of operation, and push button switches are provided to allow the FAX-1 to be manually controlled.

Normally, in facsimile reception mode, START, STOP, IOC and RPM are all automatically sensed with no operator intervention. However, this automatic operation may be overruled and manual operation substituted if so desired.

Navtex transmissions can be printed simply by tuning the receiver to 518KHz. The default (power on) configuration permits all sending stations and message categories to be printed. Sending station and message categories are fully programmable.

Only the FAX-1/N version permits simultaneous reception of weather maps and Navtex messages.

Before installing and operating the FAX-1, we recommend that, at minimum, you read the sections of this manual entitled Other Equipment Required and Quick Start Procedure.

Do not get intimidated by this manual! Most operation is very simple indeed, and is fully automatic. Only when you tune into a map halfway through will you need to know what the various front panel controls do.

Technical Specification

Facsimile

IOC	288,576
RPM	60, 90, 120, 240
IOC, RPM Selection	Automatic or Manual
Start, Stop	Automatic or Manual
Picture Aspect ratio	1:1, all modes

Radio Teletype

RTTY Baud rates:	45, 50, 75, 100
RTTY frequency shifts	425, 850 Hz

Navtex

Sending station selection and message categories are fully programmable.

General

Audio input	15mV to 2.0 volts RMS
Timer: On time	16, 32 64 or 128 minutes
Printer interface	Centronics Parallel
Printer control codes	Epson FX-80 compatible
.	Epson FX-100, NEC P-2200
.	Okimate 20 (DCP-1) compatible
Tuning indicator	15 LED frequency analyser
Power supply	10-15 volts DC at under 400 mA

Negligible current drain in stand-by mode

DIP switches (rear panel)

- Form feed ON/OFF
- Image Normal/Reverse (Sideband Selection)
- Timer ON period
- Printer Selection

Physical

Dimensions:220mm wide
.x 190mm deep x 70mm high
Weight:1.3 Kg
Temperature range: . . .0-40 degrees centigrade

Enclosure

The all-metal enclosure uses materials which will resist a salt air environment. Extensive screening minimises R.F. interference.

CAUTION: THE ENCLOSURE IS NOT WATERPROOF, AND (ON A BOAT) MUST BE MOUNTED WHERE WATER AND SALT SPRAY CANNOT REACH IT.

Unpacking and Installation

Unpacking

Before installing your FAX-1, please ensure that the following items are present within the shipping carton:-

- FAX-1 terminal unit
- Mounting bracket
- Four nylon mounting screws and four washers
- DC power lead
- Receiver audio lead
- Spare fuse
- Battery (may already be installed)
- Self adhesive feet
- Double screened printer cable

Should any items be missing, please inform your dealer.

Other Equipment Required

Before you can use your FAX-1, you will need the following additional items:-

- A good quality single sideband communications receiver, preferably covering the range 100 KHz to 30 MHz. In practice, most of the transmissions of interest are within the range 3 to 10 MHz. The receiver should be capable of receiving J3E transmissions, and if the tuning is synthesised, the tuning increments must not be larger than 10 Hz. Lower sideband (LSB) reception gives better results than USB, although USB can be used.
- A reasonable antenna is required for the receiver. At minimum, this should be 10 metres of wire, hung as clear of surrounding objects as possible. On a yacht, the (insulated) backstay makes an ideal antenna. If space is at a premium, one of the many compact active antennas that are now available should be considered. Suitable active antennas are available from ICS Electronics Ltd, or your dealer.

- When using a long wire type antenna, a good ground for the receiver is essential. This can be a copper rod 1 metre long, driven into the ground; the cold water piping system in a building, (assuming that the pipework is metal), or it could be the metal keel of a yacht (provided it is not encapsulated). A good ground is not necessary when using an active antenna.
- For a fixed installation, a low cost stabilised 12 volt dc power supply is needed. Suitable power supplies are available from ICS and its dealers.
- A small extension loudspeaker is desirable. This is because plugging in the extension speaker lead (used by the FAX-1) generally cuts out the internal loudspeaker within the receiver. By plugging in the extension speaker to the FAX-1, the audio is restored. An alternative would be to modify the receiver so that the audio does not cut out when an extension speaker lead is plugged in. This is generally fairly straightforward. The ability to switch the loudspeaker on and off is very useful, as otherwise the continual noise of facsimile transmissions can prove distracting.
- A suitable printer. This should ideally be Epson FX-80 compatible, with parallel data input (though some other printer types are also provided for). If you are not sure that a given printer is compatible, then the words Quad Density Graphics or NLQ printing appearing in the printer specification give some idea of its suitability. Without either of these two features, the printer may not be suitable. The output of the FAX-1 will be 80 columns wide, unless the FX-100 compatible output is selected.

To obtain maximum resolution of the printed image, a printer with the smallest needle diameter possible should be selected.

In order to avoid printer buffer overflow when printing a long series of maps, a printer with a draft print speed of at least 150 characters per second should be selected. In practice, however, a printer of 100 or 120 cps will suffice most of the time, as most transmitting stations leave a sufficiently long gap between their map transmissions to allow a slower printer to catch up.

Many printers have a temperature sensor in the print head, which slows the print speed down when the head is getting warm. This can very easily happen when printing large areas of black - for example, with cloud cover pictures.

In terms of paper handling, a printer with roll paper feed is ideal, as the installation can be very compact and no perforated lines appear in the middle of a page. Alternatively, a printer with push tractors and a quick tear edge above the paper line is also a good solution.

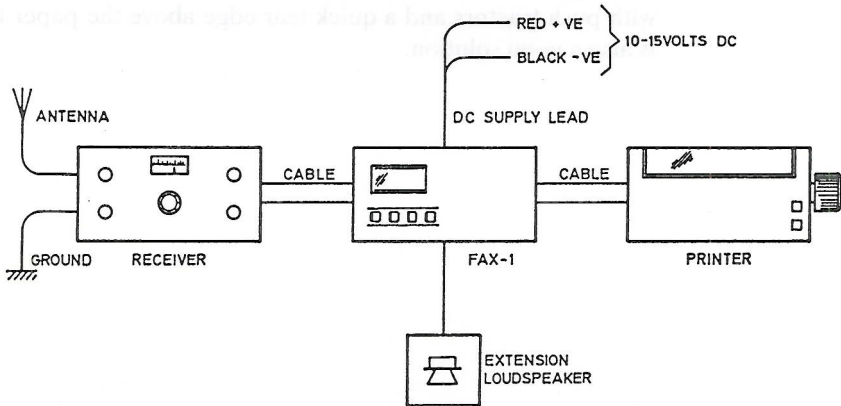


CAUTION When connecting or disconnecting leads ensure that the equipment at both ends of the cable is switched OFF.

Always ensure that the equipment is properly grounded. It is the purchaser's responsibility to ensure that the equipment is properly grounded. The equipment should be grounded to the earth ground. The equipment should be grounded to the earth ground. The equipment should be grounded to the earth ground.

Quick Start Procedure

The system should be assembled and configured as shown in the diagram below.




CAUTION: When connecting or disconnecting leads, ensure that the equipment at both ends of the cable is switched OFF.

After switching the system ON, all you need to do is to tune to the desired facsimile transmission frequency at the appropriate time. The receiver ideally should be set to **LOWER SIDEBAND** (if this is not possible, alteration of a rear panel DIP switch permits upper sideband reception).

Many receivers display the suppressed carrier frequency rather than the passband centre frequency. In this case, with lower sideband selected, you should tune **2.2 KHz higher than the listed frequency**.

If a map is being sent (indicated by a repetitive rasping noise), the signal should be tuned in so that a band of LEDs centred around the centre of the tuning display are illuminated. The right most LED should be more strongly illuminated than the others. See diagram below:



 = illuminated

If you do nothing now, and provided the printer is switched **ON LINE** and the **AUTO** light is on, the system should start printing at the start of the next map. *As the FAX-1 is locking in to the new picture transmission, the **START** light should start blinking and then go **ON** prior to starting to print.*

If you want to start printing immediately you hear a map being transmitted, simply press **START** and the map will start printing, although it will probably not be correctly positioned on the page.

If the transmitting station is pausing between maps, then only one LED will be illuminated. Assuming that you are using lower sideband reception, this will be the fourth or fifth from the right hand side of the display.

This rule does not apply to LF transmissions, which have a narrower shift. With these transmissions (LSB reception), the 6th LED from the right should be lit in between maps.

Useful Publications

A number of publications are available which list the frequencies of transmitting stations, together with their schedules and a brief description of the content of each transmission:

Admiralty List of Radio Signals, Volume 3.

This lists all the weather map transmission likely to be of interest to the mariner, and is constantly updated. Navtex and RTTY weather transmissions are also included. It is available from all British Admiralty chart agents and is published by: The Hydrographer of the Navy, Taunton, Somerset, England.

A Guide to Facsimile Stations

This is published by Klingenfuss Publications, Hagenloher Str. 14, D-7400 Tuebingen, West Germany. Telephone: + 49 7071 62830. It gives a very good introduction to the theory of facsimile transmission, as well as listing the frequencies, times and map contents for the principal weather facsimile transmitting stations throughout the world. It contains lists of weather maps likely to be of interest to the aviation community, and shows examples of many of the maps that are transmitted.

Meteorological Facsimile Broadcasts

This book is published by the World Meteorological Organization, and lists all weather facsimile broadcasts. It is kept up to date with a two monthly supplement service. The present cost is Sw Fr22, and enquiries should be addressed to the Sales and Publications Unit, WMO Headquarters, Case Postale No. 5, CH-1211 Geneva 20, Switzerland.

Maritime Radio Navtex

This is a free leaflet, listing all European Navtex transmissions, and is available from: Maritime Radio, British Telecom International (Ref. MR3.1.1), 1st Floor, 43 Bartholomew Close, London EC1A 7HP

RTTY Transmission Frequencies

There are many books available which list RTTY transmission frequencies, times and formats. Two sources are listed below:-

Universal Electronics Inc., 1280 Aida Drive, Reynoldsburg, (Columbus), Ohio 43068, USA

and

Klingenfuss Publications, Hagenloher Str. 14, D-7400 Tuebingen, West Germany, Tel: + 49 7071 62830

Interpreting Weather Maps

For yachtsmen, an excellent book is available on interpreting and understanding the various maps which you can print with the FAX-1. It is called 'Reading the Weather' by Alan Watts, and is published by Adlard Coles.

Weather Facsimile Frequencies

Within Western Europe, the following are the frequencies most likely to prove of interest:

Bracknell, UK

3.289.5

8.040

11.086.5

4.782

9.203

14.436

Quickborn, FRG

3.855

7.880

13.882.5

Northwood, UK

4.247.85

6.436.35

8.494.85

Offenbach, FRG

134.2 KHz (narrow shift)

Rome, Italy

4.777.5

8.146.6

13.600

NOTES:

- All frequencies have been listed in MHz, unless otherwise indicated.
- Don't forget to tune your receiver 2.2 KHZ up from these listed frequencies if using lower sideband.
- The Offenbach transmission operates with a narrower frequency shift than the other transmissions. Good reception will be obtained if the tones are centred around the middle of the tuning indicator.

Radio Propagation Considerations

For most transmitting stations, several transmission frequencies are listed. The optimum frequency to select will depend upon your distance from the transmitting station, the time of day, the season and the level of solar activity. If you select the wrong frequency, you will either get no print out or one with a lot of noise in it, in the form of random black dots.

Another problem which can occur, particularly at night, is multi-path propagation. This results in a printout which looks smudged and devoid of detail. In certain circumstances it may not be possible to obtain good reception from a particular station at all. In this case, it is probably better to obtain the information you require from another station, or simply wait until a more suitable time of day.

Basically, there are two ways in which radio waves can get from the transmitting site to your receiving site:

- Ground wave propagation, where the signal hugs the surface of the earth, getting ever weaker as it travels out from the transmitting station. This mode is most efficient at very low frequencies.
- Ionospheric propagation - the reflection of radio waves from ionised layers in the atmosphere at heights between 70 and 200 miles above the earth's surface. Broadly speaking, up to the maximum usable frequency (MUF), ionospheric propagation is more efficient the higher the frequency.

At low frequencies, for example the Offenbach transmission listed previously, the dominant propagation mode is ground wave transmission. At frequencies above 10 MHz or so, the dominant propagation mode is sky wave reflection from the ionosphere. At the main frequencies we are interested in - in the area 3 to 10 MHz - both propagation modes operate quite effectively. This introduces two problems:-

- There is often an area between the end of the ground wave propagation zone and the start of the sky wave

propagation zone where no signal reaches the receiver. This is called the skip zone.

- There are areas, particularly at night, where the sky wave and the ground wave arrive at the same time, producing fading and multi-path propagation, and thus ruining any weather maps.

Without dwelling too much more on the question of propagation (and more can be learned from the literature), the following practical rules apply:-

Frequency Range	Useful Range (Day)	Useful Range (Night)
100 - 200 KHz	0-500 miles	0-800 miles
2.0 - 4.0 MHz	0-200 miles	100-800 miles
4.0 - 10.0 MHz	100-500 miles	200 miles +
10.0 MHz +	300 miles +	none

The maximum usable frequency is determined by the level of solar activity.

The above represents a gross generalization, and there will be considerable seasonal variations in this information. However, it should help you to find the best and most workable frequency to use.

In the final analysis, some experimentation will be required. Most facsimile transmissions are made on more than one frequency, so if reception is not satisfactory on one, you should try each of the other frequencies listed until you achieve the best results.

The Theory of Weather Map Transmission

Weather maps are sent by the operator at the transmitting station wrapping the original around a drum, which is then set to revolve. A light detector moves slowly along the drum, thus scanning the image in a helical fashion. The output of the light sensor is used to modulate a radio wave. One transmitted frequency represents black information, and another represents white.

RPM (Revolutions per Minute) is a measure of the drum's rotation speed.

IOC (Index of Co-operation) is a measure of the rate at which the light sensor travels along the transmitting drum. It is calculated from $(L \times f) / \pi$ where L is the scanning line length and F is the number of scanned lines per unit length.

Clearly, the FAX-1 needs to know when the printed map should start and stop, and what the IOC and RPM requirements are. This information is supplied by the transmitting station as a series of tones (alternating black/white signals).

The first tone to be transmitted is at 300 or 674 Hz, and it lasts from 5-10 seconds. This sets the IOC to be received. Next comes 30 seconds of 1, 1.5, 2.0 or 4.0 Hz tone. This sets the RPM to be received and also sets the start position of the map so that it is correctly centred on the paper.

Next, the map itself is transmitted, at the end of which a 5 second tone of 450 Hz is sent, followed by 10 seconds off black signal. This signifies the end of the map.

All of these tones are detected automatically by the FAX-1. At power on, the unit is configured for an IOC of 576 and an RPM of 120 (the most common configuration for weather maps). It is also configured for AUTOMATIC reception.

If the IOC or RPM differ from this initial setting, it will re-configure itself automatically at the start of the map.

The START light will go on as the map is printed. The stop tone will turn the START light off at the end of the map.

In the FAX-1, all the automatic operations which are initiated by received tones can also be initiated manually from the front panel. However, if a map is started manually part way through, the phasing buttons will need to be used in order to centre the image on the page (see page 20).

Operation and Connections

Setting the Timer

The timer on interval can be set by means of the rear panel DIP switches. This procedure is described in the next section.

The current time of day can be set by using the HRS and MINS buttons on the front panel.

To set the turn on time for printing a map or series of maps, depress the SET START button, and at the same time push the MINS and HRS buttons to set the desired turn on time.

If you want to turn the unit off after the timer has turned it on, depress TIMER CANCEL.

Front Panel Controls and Indicators

The front panel controls and indicators of the FAX-1 have the following functions:-

Clock

The LCD clock gives the current time of day, and may also be set to turn the FAX-1 and ancillary equipment on for a specified time interval each day.

Clock Controls

The use of SET START, MINS, HRS and TIMER CANCEL are described above.

On/Off

This turns the FAX-1 ON or OFF, overriding the timer function. To use the timer, it must be set in the OFF position (out). It also switches on or off any equipment connected to the rear panel EXTERNAL socket.

(See page 22 for FAX-1/N operation.)

IOC

Repeated pressing of this control selects between Index of Cooperations of 288 and 576, as indicated by the LEDs. It is also used to select RTTY modes (both IOC indicators lit for NORMAL tones, and both extinguished for REVERSE tones).

RPM

Repeated pressing of this control selects between drum revolution of 60, 90, 120 and 240 revolutions per minute in facsimile mode. In RTTY mode, it selects between received Baud rates, which are indicated by the RPM LED displays as follows:

<u>RPM</u>	<u>Bauds</u>
60	45
90	50
120	75
240	100

AUTO

This control turns automatic reception on or off (as indicated by the LED) in facsimile mode. In the off position, the FAX-1 must be controlled manually. In RTTY mode, this control enables or disables unshift on space (USOS). With the indicator on, this feature is enabled and forces a letters shift each time a space character is received.

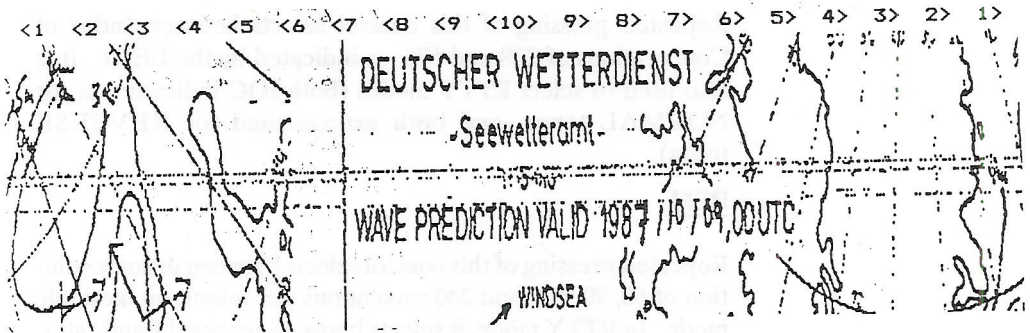
Start

This control permits the printing of a map to be initiated manually in facsimile mode. The indicator shows that a map has started printing, whether this has been initiated automatically or manually.

In RTTY mode, it starts or stops printing.

Phase

In manual printing mode during facsimile reception, these controls permit a map that has been started part way through to be correctly centered.



In the above example, the right hand PHASE button must be pressed seven times in order to centre the map.

In RTTY mode, pressing either of the PHASE buttons prints the current RTTY buffer contents without waiting for a line feed or a carriage return.

These buttons also permit station and message category selection for Navtex reception. See the section on Navtex for further information.

Tuning Indicator

This shows whether or not the receiver has been tuned to the correct frequency. In both Facsimile and RTTY modes, correct tuning is indicated by two patches of illumination on the display, both symmetrically positioned either side of the centre. The right hand side of the tuning display is illuminated when white information is being transmitted. The left hand side of the display is illuminated when black information is transmitted.

Rear Panel Controls and Connectors

The rear panel has a number of connectors to enable the FAX-1 to be connected to other parts of the system. It also houses an eight way DIP switch for setting basic operating parameters. The functions of these are as follows:

Printer Port

This is the parallel interface to the printer. The required cable (supplied) is IBM-PC compatible. The various pins of the connector have the following functions:-

PIN	SIGNAL
1	(STROBE)
2	DATA 0
3	DATA 1
4	DATA 2
5	DATA 3
6	DATA 4
7	DATA 5
8	DATA 6
9	DATA 7
10	(ACK)
11	BUSY
18-25	GROUND

DIP switches

On delivery, the switches should be found set to the factory default position. These are: Switches 1 - 5 UP; switches 6,7 DOWN; switch. 8 UP.

The functions of the switches are as follows:-

SWITCH	FUNCTION
1	Sets timer on interval
2	Sets timer on interval
3	Sets timer on interval
4	DOWN to enable timer
5	UP for LSB Fax receive
6	Selects printer emulation
7	Selects printer emulation
8	DOWN for end of map form feed

IF YOU HAVE RECEIVED A COMPLETE FAXPACK OR MARINEPACK SYSTEM, THE DIP SWITCHES SHOULD BE SET CORRECTLY. DO NOT TOUCH THEM BEFORE YOU HAVE TRIED THE SYSTEM OUT!

Timer Operation

DIP switch 4 must be DOWN enable the timer function, or UP to disable it..

The timer on interval may be selected as follows:-

Interval (Mins.)	Switch 1	Switch 2	Switch 3
15	UP	DOWN	DOWN
30	DOWN	UP	DOWN
45	UP	UP	DOWN
60	DOWN	DOWN	UP
90	DOWN	DOWN	DOWN
120	UP	UP	UP

(FAX-1/N Only)

The FAX-1 is always powered on, and the tuning indicator will always be lit. The timer and the main power switch are connected together and have the same effect.

If the power switch and timer are both off, the AUTO light will be off and cannot be turned on manually. No maps will be automatically received.

When either the power switch or the timer are used to turn the auto facsimile receive function on, the AUTO light will be illuminated

and maps will be automatically received until the power switch and timer both turn off. During this period, it is possible to manually select AUTO RPM and IOC.

When the power switch or timer turn the system off, any map currently being printed will continue until the end.

Printer Emulation Selection

Switches 6 and 7 select the printer type:-

Printer	Switch 6	Switch 7
DCP-1	UP	UP
NEC P2200	UP	DOWN
FX-100	DOWN	UP
FX-80	DOWN	DOWN

- The DCP-1 position will also drive the Okimate 20 printer.
- The NEC P-2200 position will drive the Epson LQ range.
- The FX-100 position will drive most wide 9 wire printers.
- The FX-80 emulation will drive most narrow 9 wire printers

Form Feed

Switch 8 selects the end of map form feed. It should be down to select this feature.

Sideband Selection

Switch 5 selects the sideband to be used for facsimile reception. It should be UP for lower sideband (preferred) or DOWN for upper sideband.

Audio In/Out

Connect the AUDIO IN socket to the receiver extension output (lead supplied). Connect the AUDIO OUT socket to an extension speaker.

External

When the FAX-1 is switched on, either manually or by means of the timer, the centre pin of this connector is shorted to the surround by means of an internal relay. It is intended to handle only low current (0.5 amps), low voltage (20 volts) switching. The centre pin of this connector may be connected to 0v or 12v by means of an internal link .

+ 12 v

This is the power input connector (lead supplied). The outer surround should be connected to ground (0v), and the inner pin should be connected to a regulated + 12v supply.

1 A

This is the fuse (1 amp). If the unit does not function, this should be suspected. A spare is provided.

Battery

On the rear panel, there is a battery container, the cover of which can be removed with a screwdriver. A single HP7 long life dry battery should be fitted in order to power the clock. It should be inserted negative end first.

WARNING: The battery should be replaced annually, otherwise severe damage could result if it leaks. If storing the unit for a long period, remove the battery first.

Radio Teletype Reception

Radio teletype reception is enabled by pressing the IOC button on the front panel until both LEDs are lit (Normal tones), or both LEDs are extinguished (Reverse tones).

The correct Baud rate is set by pushing the RPM button (see previous section). If the signal is correctly tuned, printing will commence as soon as the START button is pressed. If unshift on space is required (for a noisy signal), the AUTO light should be tuned on by pushing the AUTO button.

Print out occurs only after a complete line of text has been correctly received, or if the left or right phasing button is depressed in the meantime.

Navtex

By tuning the receiver to 518 KHz, Navtex transmissions may be automatically received by the FAX-1 on the same sideband as has been selected for facsimile reception. These transmissions are not continuous, so you may have to wait a while before hearing anything. The tuning indicator should then show a patch of light, which should be carefully tuned so that it sits in the centre of the tuning display.

Each message is serialised, and the last 512 messages which have been printed since the FAX-1 was last powered on will not be printed again when they are repeated. Specific message categories and transmitting stations can be accepted or rejected by manipulating the PHASE buttons prior to commencing a Navtex listening session. The sequence is initiated by pressing either phase button whilst the unit is stopped, and is not printing a map.

The selection sequence appears as follows:

```
NAVTEX STATION SELECTION ABCDEFGHIJKLMNOPQRSTUVWXYZ  
PRESS <-- TO REJECT, --> TO ACCEPT
```

These are the default station selections. Pressing the right phasing button will accept them and carry on with the message type selection shown below. Pressing the left phasing button will reject them and prompt for new selections as follows:

```
PRESS PHASE BUTTONS FOR STATIONS A THROUGH Z  
PRESS <-- TO REJECT, --> TO ACCEPT
```

The left or right phase button must now be pressed 26 times for A though Z. This is not as painful as it sounds! Nothing will be printed until the 26th press, when the new selections will be printed with an accept/reject prompt, as follows:-

```
NAVTEX STATION SELECTION  ABCDE....JK....O...ST.....  
PRESS <-- TO REJECT, --> TO ACCEPT
```

A letter indicates that the station is selected and a dot indicates that it is rejected. Pressing the left phase button will reject and repeat the station selection sequence. Pressing the right phase button will accept the station selection and carry on to message type selection:-

```
NAVTEX MESSAGE TYPE SELECTION  ABCDEFGHIJKLMNOPQRSTUVWXYZ  
PRESS <-- TO REJECT, --> TO ACCEPT
```

Again, these are the default selections. The selection sequence is identical to that for station selection, except that message type Z is not valid. Only 25 phase button presses are required. When the message type selection is accepted, a final selection message is printed as follows:-

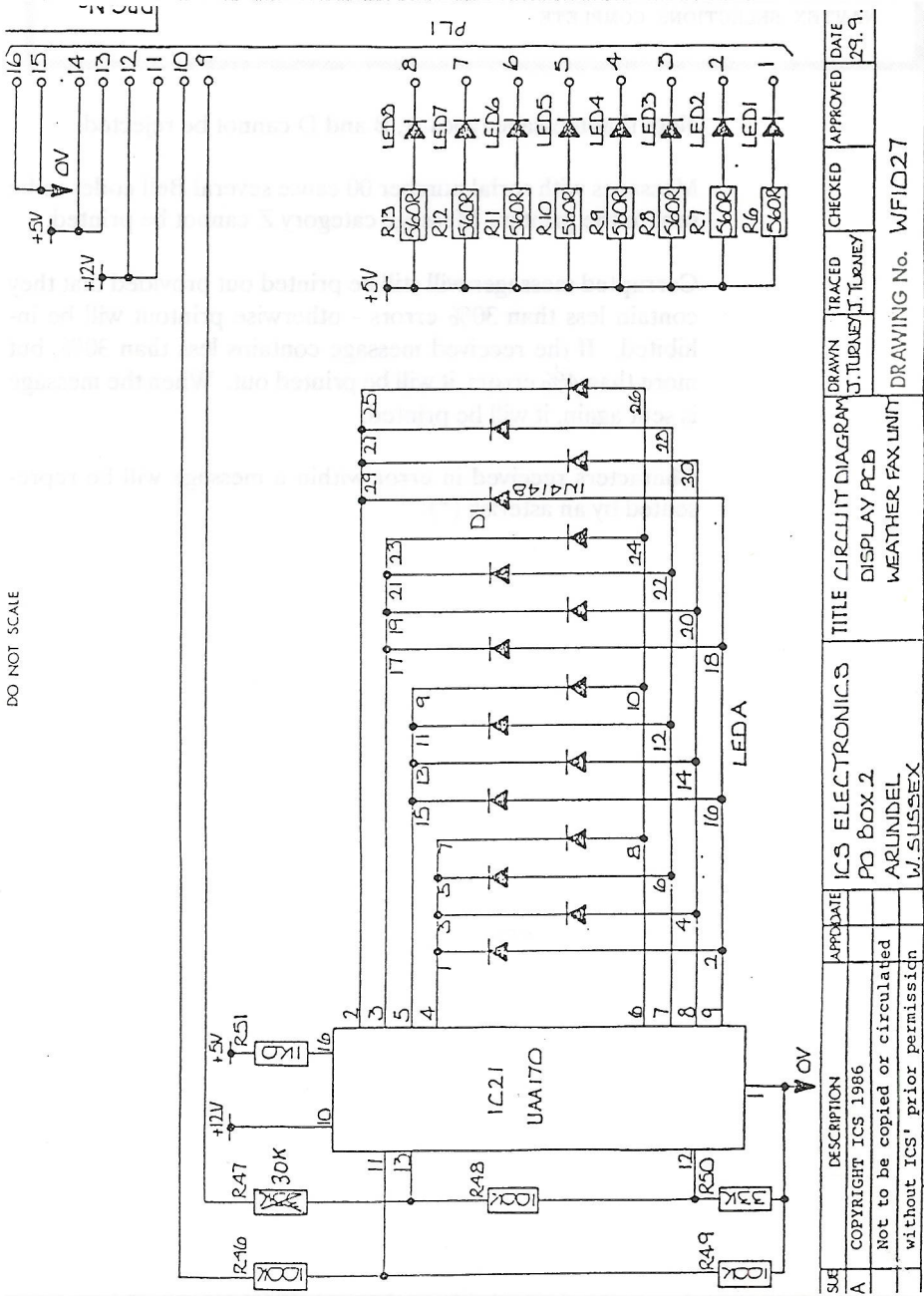
NAVTEX STATION SELECTION ABCDE.....JK...O...ST.....
NAVTEX MESSAGE TYPE SELECTION ABCDEFGHIJKL.....
NAVTEX SELECTIONS COMPLETE

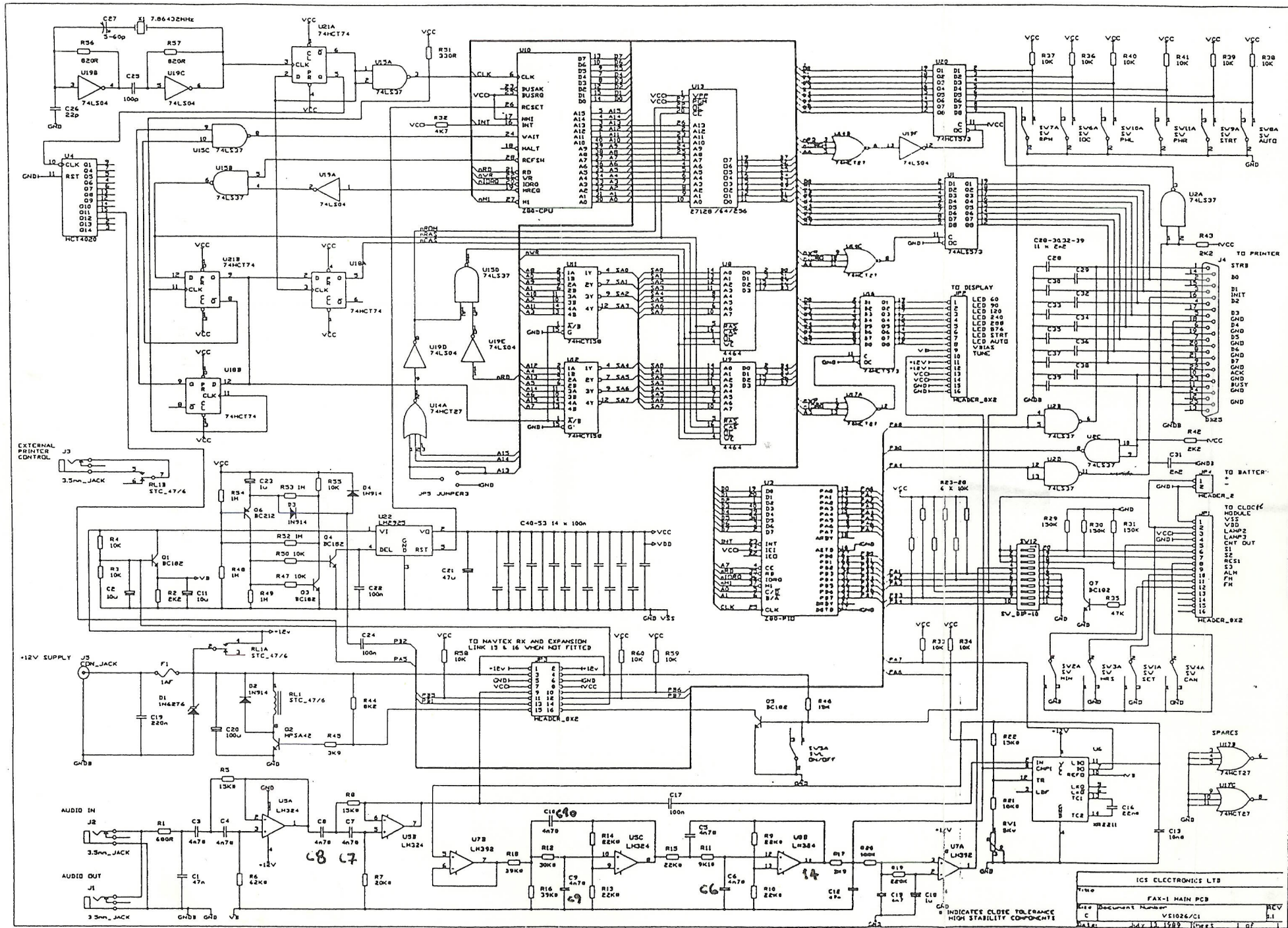
Note that message types A, B and D cannot be rejected.

Messages with serial number 00 cause several Bell codes to be sent to the printer. Message category Z cannot be printed.

Corrupted messages will still be printed out provided that they contain less than 30% errors - otherwise printout will be inhibited. If the received message contains less than 30%, but more than 4% errors, it will be printed out. When the message is sent again, it will be printed.

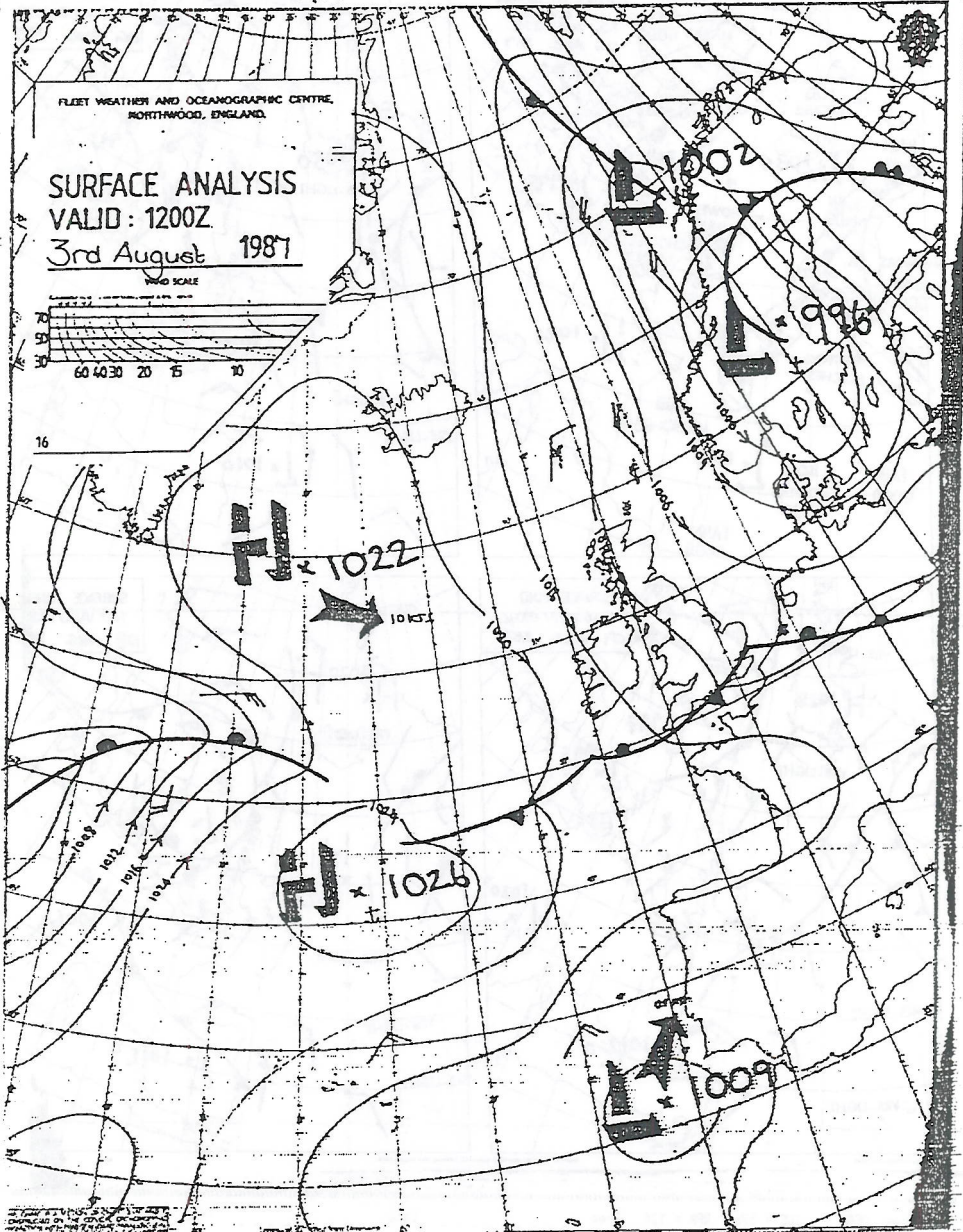
Characters received in error within a message will be represented by an asterisk (*).



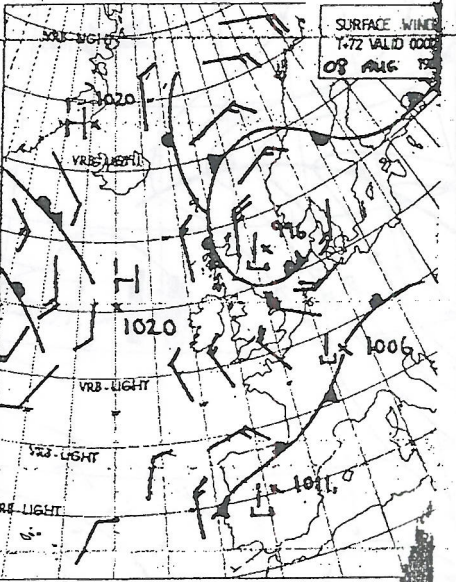
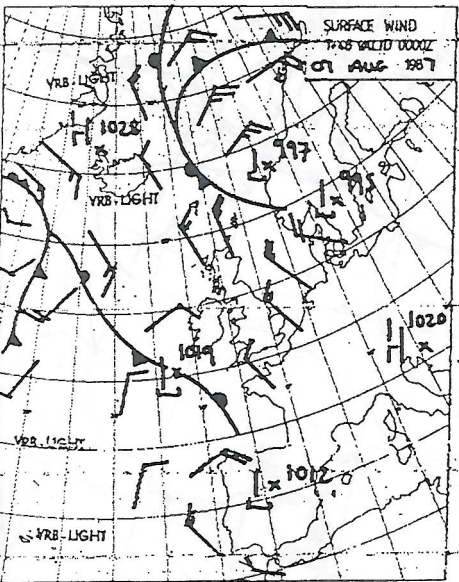
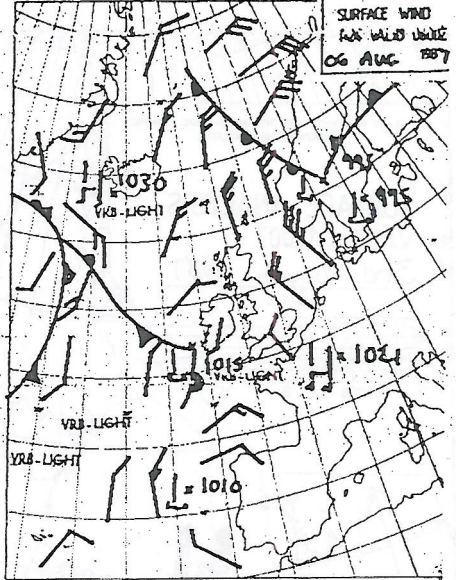
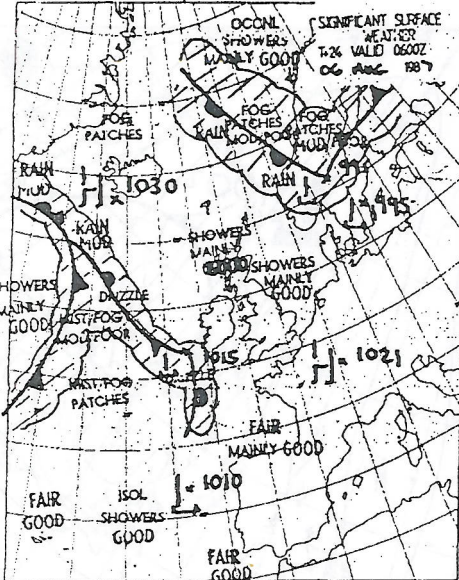


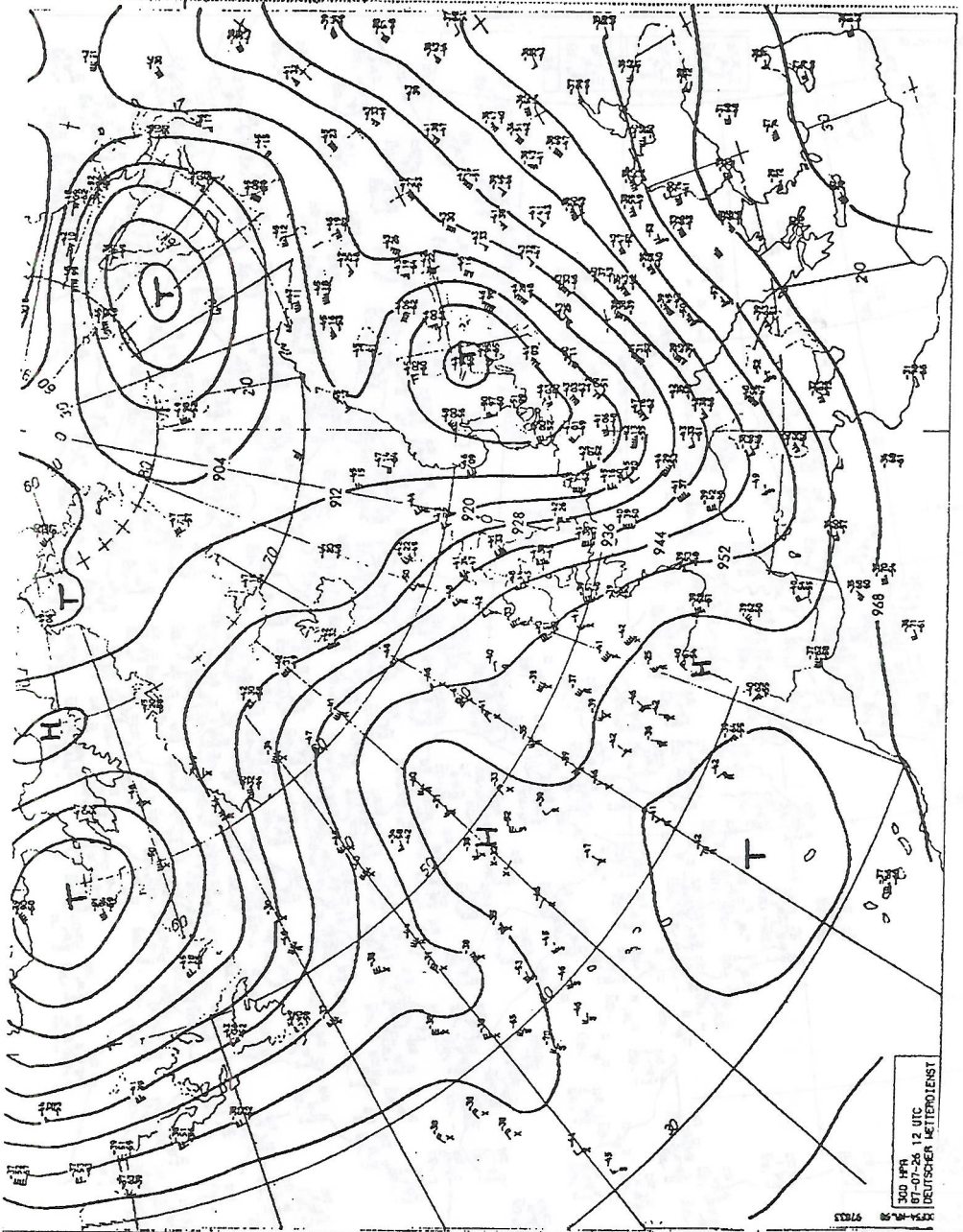
C12
47n

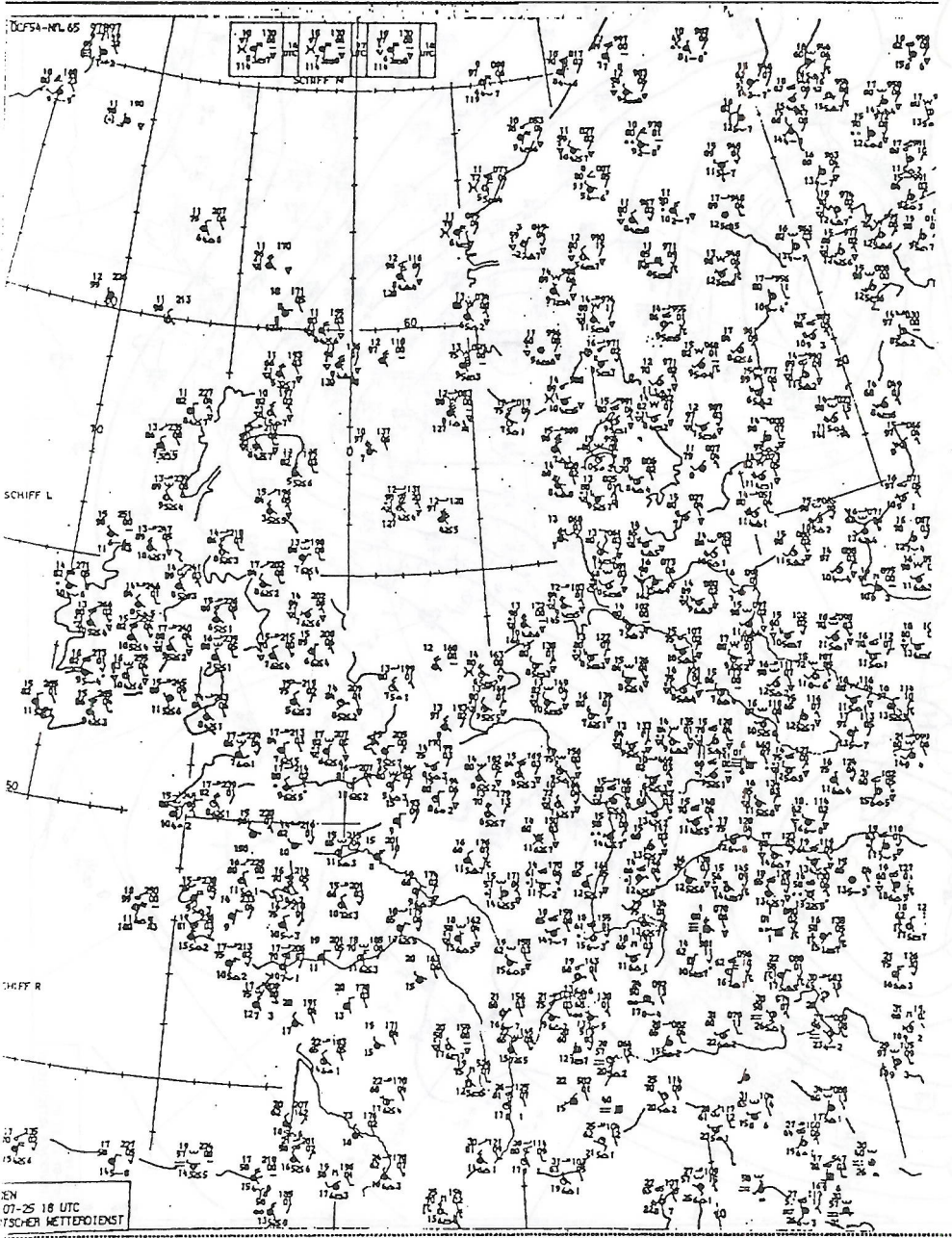
ICS ELECTRONICS LTD			
File No	FAX-1 MAIN PCB		
Doc. Document Number	V51026/C1		
Rev	1		
Date	May 13, 1989		



FLEET WEATHER AND OCEANOGRAPHIC CENTRE, NORTHWOOD, ENGLAND.







FAX-1/N Operation

The FAX-1/N operates in exactly the same way as the FAX-1. The only difference is that it has its own internal Navtex receiver, and can thus receive Navtex messages continuously - even when weather maps are being received. Any Navtex messages which have come in whilst the map was printing will be printed at the end.

The FAX-1/N has the ability to turn the printer on and off according to whether it is required for printing or not. As it will normally be powered on continuously, the ON/OFF switch simply enables and disables the facsimile function. This is also affected by the timer operation. For more details, see page 22.

An external active antenna, such as the ICS ANT-1/N must be connected to the coaxial connector on the rear of the FAX-1/N. The antenna is powered entirely by the FAX-1/N.

Any external antenna connections must be well wrapped with self amalgamating tape to guard against ingress of water.

Do not short circuit the antenna connector of the FAX-1/N. It carries power to the external active antenna. An internal fuse may blow if it is short circuited.

Marinepack Installation Notes

The marinepack system is very easy to install, provided that the following points are observed:-

- Two of the three wires from the DCP-1 printer should be connected to a source of 12 volt power. The third lead goes to the external socket on the rear of the FAX-1. This ensures that the DCP-1 is not powered on if it is not in use.
- If you use circuit breakers, do not connect the FAX-1 and DCP-1 to the same circuit breaker. It may be best to connect the FAX-1 to a circuit breaker and power the DCP-1 from an in-line fuse. The whole system will still be powered off if the circuit breaker is switched off.

The DCP-1 should be mounted on a flat surface. Any attempt to bolt it to an uneven surface could distort and seriously damage the printer.

Faxpack Installation Notes

No special precautions need be observed when installing our Faxpack system.

Just follow the system diagram shown at the beginning of this manual.

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