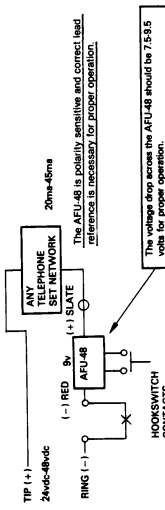


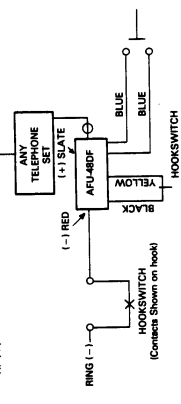
ADDENDUM APPLICATION TIPS FOR AFU-48:

1. The AFU-48 is a series insertion device, it derives its power from a series voltage drop. The unit is designed for a conventional 48vdc line. It will work satisfactorily to 24 vdc. Below 24vdc the insertion loss and reduced series current may cause erratic operation. Ideal loop current is 20ma-45ma.
2. It is virtually impossible to provide connection information for every specific telephone set on the market. A generalized connection is helpful:



The AFU-48 will tolerate ring voltage but it is a good rule to place it behind hookswitch contacts.

3. The AFU-48 DF offers two flash times.



4. Closing Black to Yellow => 1.3 Second Break
Closing Blue to Blue => 500ms Flash

1.3 Second (Black, Yellow hookswitch contact can be derived from standard spare hookswitch contacts or can be provided by using the receiver shunt contacts available on most conventional telephones. This contact must be removed from normal connection if used for the AFU-48.

**For Additional Technical Assistance
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**AFU-48 and AFU-48 DF
DESCRIPTION, OPERATION, INSTALLATION**

U.S. PATENT NO. 4,251,693
F. C. C. Registration EYH50X-15734-KX-N

application in situations where rapid action of the telephone hookswitch causes erroneous holds and ringbacks.

C. PHYSICAL DESCRIPTION
The AFU-48 DF is a small printed circuit board assembly 1 8" L x 1 3" W x 6" H. The unit has four spade tip connectors and four color coded spade tip leads. Two of the leads are connected to the trigger switch, and the remaining two leads connect to the telephone network.

2.08 The AFU-48 DF disconnect/flash unit is a printed circuit board assembly, 2 2" L x 1 5" W x 6" H. The unit has six spade connectors and six color coded spade tip leads. Two of the leads are connected to the trigger switch, and the remaining four leads connect to the telephone hookswitch and the telephone network.

D. SPECIFICATIONS
2.07 The electrical specifications of the AFU-48 are:
(a) Loop current should be limited to 60 ma maximum by loop resistance.
(b) Unit is line powered by series insertion method. Insertion voltage drop is 8 v.
(c) Radio insertion loss is less than 20db.
(d) Average flash time is 500ms based on 25 ma loop minimum.
(e) Median flash time 500ms with a maximum variation of ±18%. Average variance from median ±9%, 100% factory tested for parameter verification.

2.08 The specifications for the AFU-48 DF are identical to Part 2.07 with the following addition:
(f) Disconnect interval is greater than 1.3 seconds.

1. GENERAL
The 6000 section provides description, operation and installation instructions for the AFU-48 and AFU-48 DF automatic hookswitch flash units. For detailed circuit description refer to Section CD-6000-01.

1.02 This release of INS-6000-01 has been generated to provide up to date installation procedures for the second generation AFU-48 and the new AFU-48 DF disconnect/flash combination unit.

A. GENERAL INFORMATION
2.01 The AFU-48 and AFU-48 DF are used to provide automatic, fixed interval hookswitch flash times. The AFU-48 provides a single fixed interval flash time. The AFU-48 DF provides a fixed interval in addition to the fixed interval flash.
2.02 The AFU-48 and AFU-48 DF utilize patented electro-mechanical hybrid circuitry to provide the following: Extremely low susceptibility to static discharge and zero loop current drawn during the flash and disconnect intervals.

B. APPLICATIONS
2.03 The basic unit function is to eliminate the individual variables such as temperature, age, and humidity which affect the timing of the flash pulse. When the user pushes the special flash button, a momentary pulse of fixed duration is produced. The button can be pushed quickly or held down indefinitely and the flash duration remains the same.

2.04 In applications utilizing the AFU-48 DF any action of the telephone hookswitch will produce a disconnect pulse. The shorter fixed interval pulse can only be produced by action of the special flash button. These functions find

3. OPERATION

3.01 Single Flash: When the trigger switch is pushed, the AFU-48 single flash produces a 500ms pulse (regardless of the speed of the switch closure). The flash is accompanied by a low level click associated with relay function providing a feedback indication of the action taking place. When the telephone hookswitch is depressed for any duration, the AFU-48 DF will cycle with a 1.3 sec. disconnect pulse.

3.02 Dual Flash: When the trigger switch is pushed on the dual flash unit, a 500ms pulse is produced. The flash is accompanied by a low level click associated with relay function providing a feedback indication of the action taking place. When the telephone hookswitch is depressed for any duration, the AFU-48 DF will cycle with a 1.3 sec. disconnect pulse.

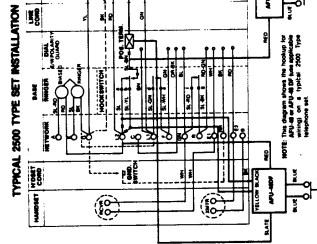


Figure 1

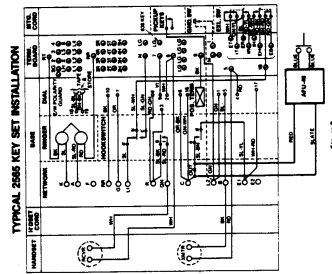


Figure 2

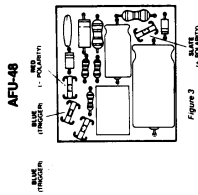


Figure 3

4. INSTALLATION

4.01 The AFU-48 and AFU-48 DF can be installed easily in the telephone sets of virtually any manufacturer. Installation requires normal hand tools. In most installations a drill motor and 5/16" hole bit will be required to mount the trigger switch in the telephone set. Refer to the wiring diagram shown for a typical 2500 type set. Figure 1. A typical key system type set is referenced in Figure 2.

A. INSTALLATION AFU-48 (Single Flash)

4.02 AFU-48 is to be connected as follows:
 RED — Ring (Polarity +)
 SLATE — Ring Out (Polarity +)
 BLUE — Trigger Switch
 YELLOW — Hookswitch disconnect
 BLACK — Hookswitch disconnect

The AFU-48 is polarity sensitive and correct lead reference is necessary for proper operation.

4.03 The installation procedure for the AFU-48 to a 2500 type set is as follows: (Refer to Figure 1 and Figure 3).
 (1) Remove SL-BN hookswitch wire from terminal 2 on polarity guard dial or network "C" on older style sets.
 (2) Connect SLATE wire of AFU-48 to terminal 2 on polarity guard dial or network "C" of older set.
 (3) Connect SL-YL of AFU-48 to SL-BN hookswitch wire. (Note: SL-BN wire can be inserted directly into quick disconnect terminal when wire length permits.)
 (4) Connect trigger switch leads BLUE to the trigger switch terminals on the AFU-48 (Refer to Figure 3).

4.04 The installation procedure for the AFU-48 to a typical keyset is as follows: (Refer to Figure 2 and Figure 3).
 (1) Remove SL-BN hookswitch lead from network "C".
 (2) Connect SL-BN to RED of AFU-48.

(3) Connect SLATE of AFU-48 to "C" network on AFU-48. (See Figure 3).
 (4) Connect trigger switch leads to terminals on AFU-48. (See Figure 3).
 (5) The trigger switch can be any type of normally open, momentary contact. The switch contacts must be free of foreign voltage and isolated from any other connection. Variations on the trigger switch can include isolated non-locking key strip buttons or isolated hookswitch contacts (200 ohm resistance). The hookswitch quick disconnect leads (less than 500ms) of the hookswitch to provide an accurate repeatable flash.

B. AFU-48 DF (Disconnect/Flash)

4.05 The AFU-48 DF has six leads (Refer to Figure 4).
 RED — Ring In (Polarity -)
 SLATE — Ring Out (Polarity +)
 BLUE — Trigger Switch
 YELLOW — Hookswitch disconnect
 BLACK — Hookswitch disconnect

The AFU-48 DF is polarity sensitive and correct lead reference is necessary for proper operation.

4.07 The installation procedure for the AFU-48 DF to a 2500 type set is as follows: (Refer to Figures 1 and Figure 4).
 (1) Remove SL-BN hookswitch wire from terminal 2 on polarity guard dial; "C" on older sets.
 (2) Remove SL and SL-YL hookswitch wires from terminal L2.
 (3) Tape and store SL-BN.
 (4) Connect SLATE of AFU-48 DF to terminal 2 on polarity guard dial; "C" on network of older sets.
 (5) Connect SL of AFU-48 DF to terminal L2 on network.
 (6) Connect SL-YL of the hookswitch to BLACK of AFU-48 DF.
 (7) Connect SL-YL of hookswitch to YELLOW of AFU-48 DF.
 (8) Connect trigger switch leads BLUE to the trigger switch terminals. (Refer to Figure 4).

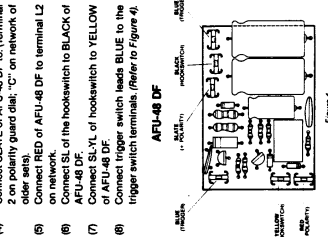


Figure 4