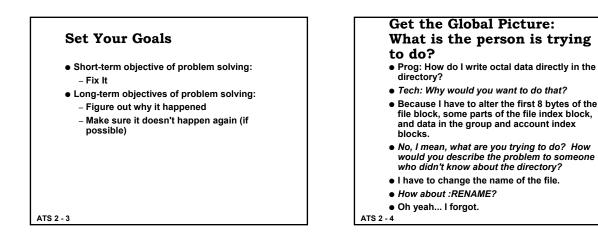


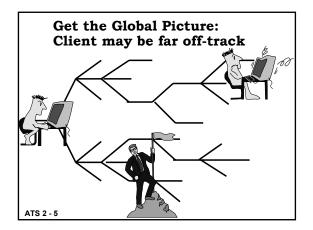
ATS 2 - 1

#### **PROBLEM SOLVING**

- Set Your Goals
- Get the Global Picture
- Distinguish Observation from Assumption
- Distinguish Observation from Hearsay
- Distinguish Observation from Hypothesis
- Challenge Your Hypothesis
- Track the Details
- RTFM
- Use Bug/Patch Reports

ATS 2 - 2





#### Get the Global Picture: Even for non-technical issues:

- Can I have system ALPHA for a production that lasts 3 hours and takes 2,000,000 sectors of space this weekend?
- Bad answer: Sorry, ALPHA's booked solid this weekend.
- Better answer: Sorry, ALPHA's booked solid this weekend. But what's the problem--what do you need? Maybe we can solve it some other way--like system BETA.
- Oh, sure, I guess BETA would be OK too

ATS 2 - 6

#### Distinguish Observation From Assumption

- The #\$@\*&^%! FORTRAN compiler doesn't work!
- Oh? That's interesting. What's the problem?
- Program working fine; now it doesn't.
- So when did you last run it?
- Was another person at another firm.
- Same model as ours--a HORTENSE 5400?
- No, uh, actually, it's a URFORB series 876.
- Say, how did you get this program, then? Tape? Diskette?
- No, I typed it in from the listing. Why?

ATS 2 - 7

#### Distinguish Observation From Hearsay

One of our terminals has double softkeys showing up. What were you doing when it happened? Running program ABC.DEF; got second set of softkeys. What do these softkeys show? The same as the original set? I don't remember. Well, can you go see it again? Uh, actually, I didn't see it myself; C told me. Get C. [...C arrives...] C, tell me again what happened. Well, I was running program ABC.DEF when... Wait a minute, not program ABC.DEF? No. that one runs fine. Why?

ATS 2 - 8

#### Distinguish Observation From Hypothesis

- There's some sort of problem with port 26 on system ALPHA; all we can get is an endless series of the letter `k' in lower case all over the screen. It's hardwired, so it must be the computer.
- No, actually, the problem is the `k' all over the screen; we don't know yet whether it's the screen or the keyboard or the cable between the screen and the keyboard or the cable between the screen and the port or the port or the AIB micro-board or the AIB itself or the SIB or the IMB or the ATP driver or the main memory boards or the CPU boards or the backplane connectors.

ATS 2 - 9

# Challenge Your Hypothesis So let's see this terminal. IDEA: If it's the port, TEST: then detaching the RS-232 connector will stop the 'k' AHA, it doesn't. The garbage has nothing to do with the link to the computer. So we look at something else. IDEA: Suppose it's the keyboard? Then TEST: removing the keyboard connection will stop it. Yes indeed, it does. I see the connector's alittle bent... oh, I see: there's a pin out of place because perhaps someone forced the connector into place. IDEA: If the pin is responsible, then TEST: perhaps bending it back will fix the problem. Yes ... it works now.

ATS 2 - 10

#### **Track The Details**

- When a major problem occurs,
  - Sit down and reconstruct the events before trying out various solutions and workarounds
- Write down everything you remember
  - What you did
  - In what sequence and
  - Whether there were unusual events before the problem occurred.

ATS 2 - 11

#### Track The Details (cont'd) Write down everything you remember and use TIMESTAMPS • What were we trying to do? • How were we trying to do it? • Exactly what did we observe? • Then what did we do in what order?

• And then what happened?

ATS 2 - 12

## Don't Prejudge What's Important

CUST: We had a system failure AB3 a few minutes ago.

SUPPORT: Exactly what did you do?

- The operator was working with spool files. He changed the outfence on Idev 6, then tried to alter the priority of a spoolfile on a remote spooled printer. Oh--he made a typing mistake on the class name: used MAX even though we had removed that class name a week ago. Then he....
- WAIT! That's it! The bad class name. There's a known bug that causes this system failure when you refer to a nonexistent class name. We'll send you a patch.

ATS 2 - 13

#### RTFM: Read the ... Fine ... Manual

Your vendor reference manuals should be

- Up to date
- Online if possible
- Accessible to programming and operations staff
- In numbered, labelled volumes
- Cross indexed by key word in a separate list
- Signed out to show where the volume is now
- Returned within a few hours at most
- Purchased separately for frequent users

ATS 2 - 14

#### **Use Bug/Patch Reports**

- Published regularly by most vendors
- Online using CompuServe or BBS
- Keyword index
- New versions may fix
- Patches
  - Program code changes
  - Self-installing: or
  - Installed using disk editor

ATS 2 - 15

#### Lab Exercises: Taking a History (for credit)

- Teacher will be a user with a technical problem
- Entire class ask questions to get a detailed history
- Write down details (for credit) and turn in with your homework at the start of Lecture 3.
- Do the same in preparing your analyses of the following exercises (see next pages)

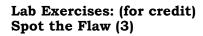
ATS 2 - 16

#### Lab Exercises (for credit): Spot the Flaw (1)

- *Identify the flawed problem solving in the* following scenario and recommend a better approach:
- Tech support learns that program not working on Monday AM
- Notes that operating system revision upgraded on Sunday PM
- Concludes that operating system revision caused the problem
- Beware "post hoc ergo propter hoc." HAND IN YOUR NOTES ON THESE EXERCISES AT START OF LECTURE 3

ATS 2 - 17

# Lab Exercises: (for credit): Spot the Flaw (2) Identify the flawed problem solving in the following scenario and recommend a better approach: • Terminal emulator connected to modem on phone line to host doesn't allow logon • Tech support orders Bell service to fix the phone line.



- Identify the flawed problem solving in the following scenario and recommend a better approach:
- User has been experiencing power failures on PC when no one else, even on same circuit, has had such problems
- User demands an uninterruptable power supply for computer

ATS 2 - 19

### Lab Exercises: (for credit) Spot the Flaw (4) Identify the flawed problem solving in the following scenario and recommend a better approach: User loses file by erasing hard disk copy User has no backup copies Tech support shows user how to use an *unerase* utility to recover file

#### Lab Exercises: (for credit) Spot the Flaw (5)

- Identify the flawed problem solving in the following scenario and recommend a better approach:
- Programmer brings tech support printout showing a problem
- Pages 1-11 of the 20 page output are missing
- Programmer claims that first half of printout not important

ATS 2 - 21

#### Homework

- Complete the analyses of the class exercise for credit (five problems in Spot the Flaw); hand them in at the start of Lecture 3.
- Read Chapter 1, "Manufacturer Support" from Wilson's *HELP!* textbook using SQ3R techniques.
- Write out and answer 10 questions covering the entire chapter and focussing on what a job interviewer might ask you. Hand them in after the quiz at the start of Lecture 3.
- Review your notes using SQ3R techniques in preparation for your quiz at the start of Lecture 3.

ATS 2 - 22